NOVEMBER 20, 1995 VOLUME 12, NUMBER 47

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

NOT TOO SUITE

This Buyer's Guide finds vendors struggling to perfect the recipe for integrated enterprise LAN managers.

See page 45.

Frame price is right

Carriers pitch credits, other deals to win over customers.

By David Rohde

South Plainfield, N.J.

Ferocious frame relay competition, combined with end-of-year budget pressures and an imminent regulatory change, has carriers offering huge financial incentives for users' frame relay business.

AT&T last month instructed its sales force to offer prospective customers up-front credits that nearly wipe out the first month's cost of frame relay ports on AT&T's InterSpan network,

See **Frame relay,** *page 72*

FRAME RELAY BATTLE MEANS MONEY BACK

AT&T is offering a onetime credit for frame relay service as follows:

Promotion type	Aimed at	Credit per port up to 64K	Credit per port above 64K
Regular	New and existing AT&T users	$200	$400
Winback	Other carriers' frame relay users	$400	$800

Examples: A new frame relay user with a network of 50 ports at 56K bit/sec receives a $10,000 credit (50 x $200). A frame relay user that leaves MCI or Sprint to go to AT&T for a 100-port net at 128K bit/sec receives an $80,000 credit (100 x $800).

SOURCE: AT&T, SOUTH PLAINFIELD, N.J.

IBM attacks the LAN

Big Blue investigates inexpensive desktop ATM migration.

By Michael Cooney

IBM is trying to fuel the ATM revolution by exploring software technologies that would enable users to upgrade existing token-ring adapters to support 25M bit/sec Asynchronous Transfer Mode workgroups.

ATM at the local network level faces a number of challenges, mostly from token-ring and Ethernet vendors that can provide an easy migration to high-performance switched nets at a lower cost than ATM.

For IBM and others trying to establish a foothold in the ATM world, an inexpensive entry point is imperative for success, analysts said. Other companies, such as Nashoba Networks, Inc., Connectware, Inc. and Whitetree Network Technologies, Inc., are also deploying products to ease LAN integration in ATM campus environments.

"If IBM could deliver this capability, it would turn vendors in the ATM and token-ring switching markets on their head," said Anura Guruge, an independent analyst based in New Ipswich, N.H.

One option IBM is evaluating is delivering software for its current LANstreamer 4M/16M bit/sec Token-Ring adapter, which would enable it to output traffic in 53-byte ATM cells at 25M bit/sec. The adapter would have

See **ATM migration,** *page 71*

KICKING UP CICS MANAGEMENT

Looking for an easier way to control, monitor and automate activities within distributed CICS environments? Help is on the way from IBM. See story, page 8.

IBM gives Microsoft company in server software suite mart.

By Kevin Fogarty

Las Vegas

IBM officials last week confirmed that the company hopes to swoop in on the server suite market with an OS/2-based challenger code-named Eagle.

Art Olbert *says IBM is looking to bring out AIX and Windows NT versions of the suite in '96.*

The OS/2 Warp Server suite will contain versions of IBM's DB2 database, Internet Server gateway, Notes 4.0 groupware, SystemView systems management product and Communications Manager SNA gateway.

While Eagle matches all of Microsoft Corp.'s BackOffice components, it also will include a CICS transaction processing (TP) monitor and the Directory & Security Services (DSS) Man-

See **Server suite,** *page 72*

Analysis

Server stuffing: A new twist on an old idea

By Jodi Cohen

Is a server any place for a hub, router or switch to hang out?

Compaq Computer Corp. thinks so. That's why it has partnered with router king Cisco Systems, Inc. and suddenly loosened its purse strings to add hubs and switches to its product line by buying Thomas-Conrad Corp. and NetWorth, Inc.

Piling an assortment of internetworking technology onto servers will simplify management and lower equipment costs for customers, according to Compaq. That's much the same argument made by hub vendors that for years have been positioning their chassis systems as all-in-one boxes.

However, in this era of distributed computing, where the idea is to buy quality components and string them together, critics questioned why you'd want to set up a potential central point of failure consisting of a server vendor's handpicked internetworking gear. While server-based internetworking might be suitable for small and remote offices, it falls short of many enterprise network needs, they said.

"For small networks, it's an easier buy because it reduces vendor complexity," said Glenn Gabriel Ben-Yosef, president of the Clear Thinking Research, Inc. consultancy in Boston. "But at the enterprise level, most users want best-of-breed products and don't want to put all of their eggs in one basket."

But Charlie Robbins, vice president of communications

See **Compaq,** *page 70*

CONSOLIDATION CONSIDERATIONS

Integrating server, internetworking and other technologies into a single device has benefits and drawbacks.

Pros	Cons
Simplifies network design.	Creates a central point of network failure.
Simplifies management.	May limit expandability.
Reduces number of vendors involved.	May diminish performance.
Cuts service and support costs.	May be difficult for vendors to integrate diverse technologies.
Saves space.	Does not necessarily promote the use of best-of-breed products.
Obviates need for users to become integrators.	

Access Network World Fusion using the number in yellow. See page 5 for details.

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HP challenges big boys with NT OpenMail

By Carol Sliwa

Cupertino, Calif.

When Hewlett-Packard Co. anointed Lotus Notes as its strategic groupware and messaging platform a year ago, the industry quickly erected a tombstone for OpenMail.

But HP's current plans are far from moribund. The firm is moving to port its messaging engine to Windows NT and tie it closely to the Web, perhaps through a new partnership with Netscape Communications Corp.

OpenMail has had a low profile because it exists primarily on the backbone, and HP plans to keep its enterprise footing. But the firm also wants to displace more popular departmental systems, pitting OpenMail against Lotus Development Corp.'s Notes and cc:Mail, Novell, Inc.'s GroupWise and Microsoft Corp.'s upcoming Exchange Server.

The NT version is key to that plan. It will help OpenMail coexist with other NT messaging serv-

See **NT OpenMail,** *page 71*

Push the info envelope with these resources:

- **An overview of the OpenMail architecture.**
- **A look at Lotus' plans to link the Web with cc:Mail.**
- **Info on Internet-based client/server E-mail systems.**

Connect to **http://www.nwfusion.com.** Select News+ then Front Page.

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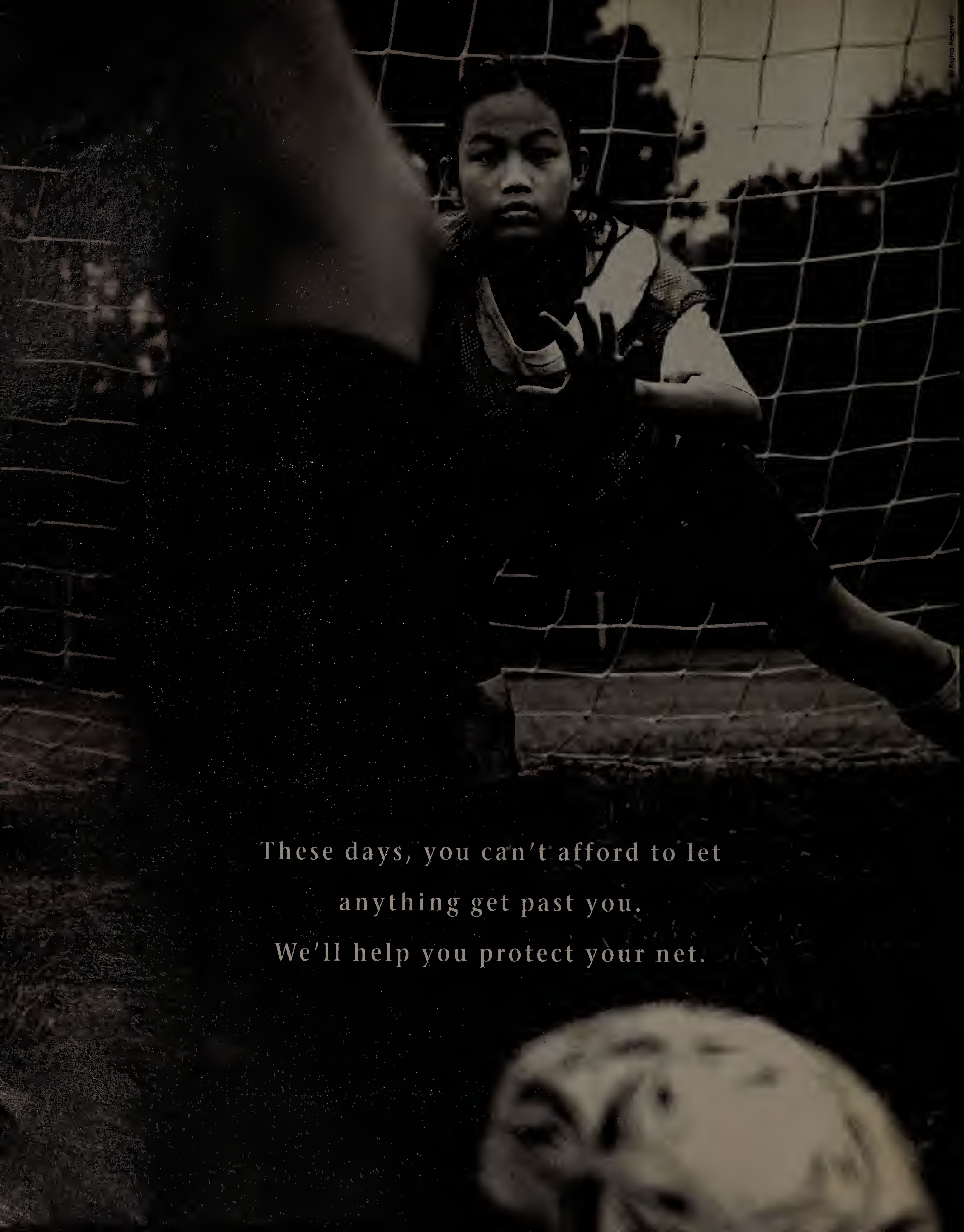
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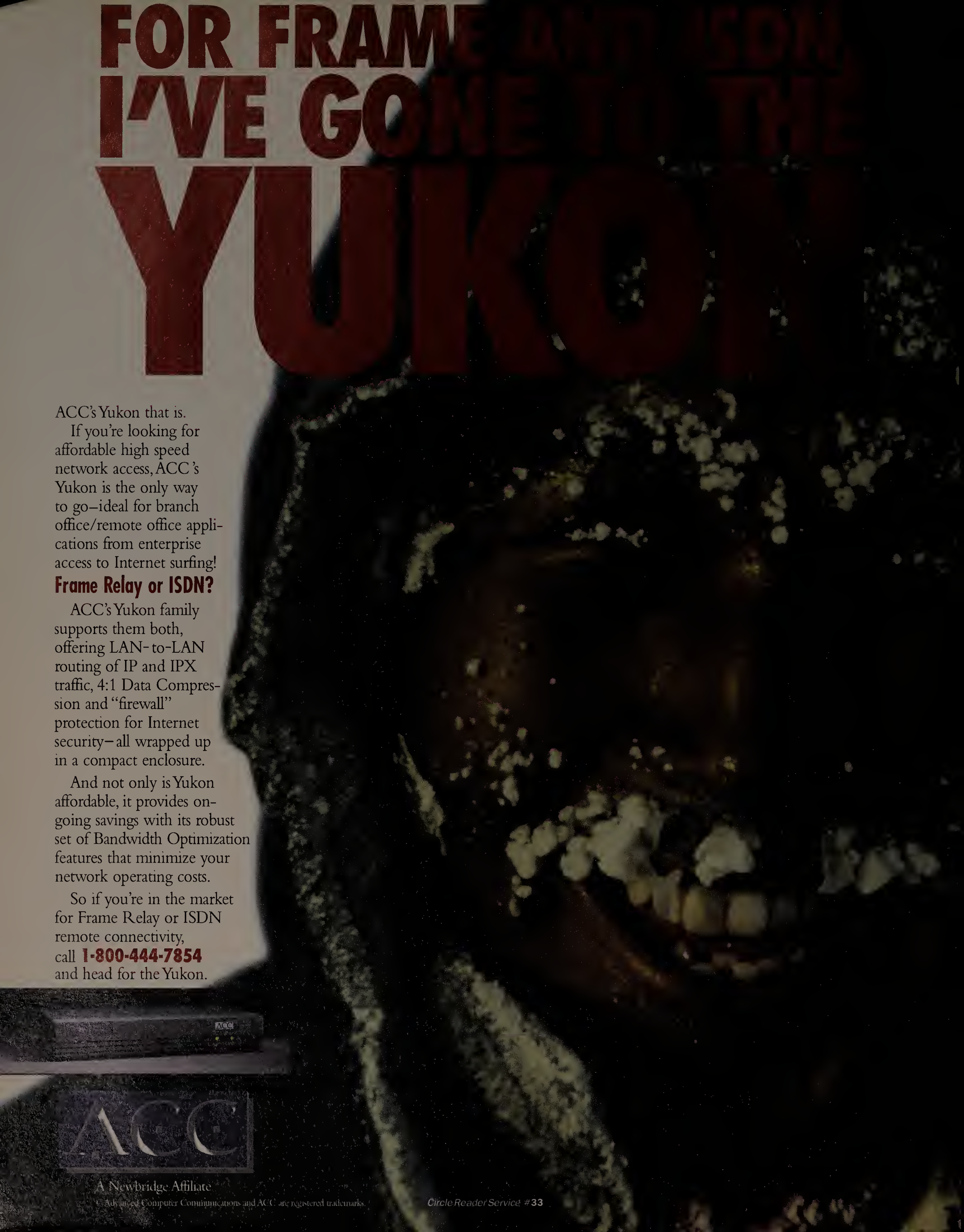

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Circle Reader Service **#33**

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Contents

STEVEN BORNS

IBM's Lou Gerstner *gets serious about "network-centric" computing. Can he pull it off? Page 22.*

News

6 **National Semiconductor** finds Java no average Joe.
8 **'Net service providers** object to Bell Canada rates.
10 **Microsoft and industry** consortium ease workflow deployment.
10 **Increased competition and** layoffs degrade local carrier service.
14 **Thinking Machines focuses** on clustering software.
14 **MCI is rolling out** new networkMCI Conferencing components.
71 **Microsoft set to release** its first Web server to beta.

Coverage from Comdex

8 **The first PowerPCs** based on CHRP spec expected in '96.
25 **McAfee, Arcada** and others raise the stakes in LAN backup market.
70 **ARDIS lays off 20% of workers** but still rolls out wireless products.

WANs & Internetworking

17 **Apertus opens up new** MQSeries possibilities, tosses in better TCP/IP-to-mainframe ties.
17 **Early CDPD proponent** Southwestern Bell Mobile is latest endorser of the analog cellular net for data.
18 **Tools from Systems & Networks** help users brainstorm about high-speed switch possibilities.

SPECIAL FOCUS
Network outsourcing
More and more users are paying outsiders to monitor networks, saving money and letting IS focus on strategic technologies.
Page 24.

Management Strategies

55 **How to win executives'** support for net upgrade.
55 **Management Data On-line:** MIBs to download and on-line training.

Features

Buyer's Guide: *Vendors are busily mixing ingredients, but none yet has the recipe for an integrated enterprise LAN manager.* **Page 45.**

Gateways to the World: *Roam the Internet from your desktop with the help of one of these gateways that sit next to your NetWare server.* **Page 49.**

Network World TEST ALLIANCE

Local Networks

25 **College puts OS/2** Warp Server beta to the test.
25 **Electric utility turned** on by token ring.
26 **Agile moves to support** IP multicasting over switched nets.

Client/Server Applications

33 **Database vendor to put** acquired OLAP technology to use in data warehousing strategies.
33 **Model-based client/server** tool set links to TP monitors.
33 **Lotus to port Notes to** Digital's 64-bit Alpha hardware platform.
34 **Excalibur takes a stab** at the Web-based tool market.

Electronic Commerce

37 **AT&T is too vague** on plans for Internet commerce, skeptics say.

Technology Update

41 **Recent FDDI configurations** boost the technology's survivability.

Opinions

22 **Daniel Briere and Christine Heckart** find value in untapped ISDN PRI.
28 **Skip MacAskill and Melinda Le Baron** travel around the UB World.
35 **Marc Myers** would bet on Oracle and Novell.
37 **Mark Gibbs** is in a shopping state of mind.
42 **Editorial:** Check out Seagate Technology.
42 **Linda Musthaler** on balancing interoperability and freedom of choice.
43 **Kathryn Korstoff** sees a Clint Eastwood movie in high-speed LANs.
73 **Back to Reality:** The inter-personal computing is a Trojan horse that will only benefit vendors.
73 **CyberSpeak:** Is there a need to upgrade to Pentium Pro right away?

Network Help Desk. *Page 41.*
In-Box. Letters from our readers. *Page 43.*
Editorial and advertiser indexes. *Page 69.*

NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

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This Week

The Front Page:
Explore IBM's planned BackOffice killer.
Dig into the FCC order that's shaking up frame relay pricing.
Look at the technologies Compaq hopes to merge into single-server internetworking devices.

The Technical Sections:
Compare AT&T's Internet offering with those of competitors in Electronic Commerce.
Put on your hard hat and delve into data mining, with primers on data warehouses and on-line analytical processing, in Client/Server Applications.

Technology Resources: Our new Internetworking page is a hub for resources on bridges, switches and related technologies.

Professional Development: New seminars.
DirectConnect: Download demo software.
Network World Central: Get in touch with us.

this week's pick

Need more info on Notes? The Institute for Information Management at the University of St. Gallen in Switzerland maintains a huge collection of Notes-related Internet resources at http://www-lnl.unisg.ch/delta/links/index.html.

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News briefs, November 20, 1995

Duke Power won't pull OpenView plug

DONNA BISE

Edmunds

■ Duke Power Co. has decided to retain OpenView as its enterprise management platform after all. Hewlett-Packard Co. "provided a solution that met our requirements," said Duke senior IS analyst Paul Edmunds, who is also president of the OpenView Forum user group. Citing scalability problems with OpenView, the utility was mulling a switch to IBM's NetView for AIX (*NW*, Oct. 16, page 1).

Novell negatives

■ Novell, Inc., based in Provo, Utah, announced last week it would lay off 420 employees from its Business Applications Division, a move designed to trim costs and make the former WordPerfect Co. more attractive to potential buyers. In a separate action, Novell is being sued in U.S. District Court in Alameda, Calif., by Action Technologies, Inc., which charged that the workflow features in the GroupWise electronic mail package infringe on Action's patents.

Exchanging Notes

■ Mesa Communications, Inc. of Newton, Mass., is developing a gateway that would connect discussion groups in Lotus Development Corp.'s Notes and Microsoft Corp.'s upcoming Exchange groupware products. The product will replicate shared documents and discussion threads, not just electronic mail, and will act as a bridge for companies deploying both Notes and Exchange. The gateway will ship in Mesa's ConferencePlus group conferencing software, which has similar gateways for Notes and Internet discussion groups.

Bye-bye, B.J. — almost

CINDY CHARLES

Johnson

■ IBM's Networking Hardware Division got another shake-up last week as William "B.J." Johnson, the general manager of the division, stepped aside. Lutz Hahne, currently a vice president and general manager of the Application Solutions Division, will become general manager of the Networking Hardware Division. Johnson won't go far, however, as he will become a strategic consultant for the company. According to analysts, Johnson had been increasingly coming under fire for waffling on strategic directions and not getting IBM's networking hardware out the door fast enough.

In an effort to move some of IBM's current networking projects along faster, the company also created a new position, general manager of networking hardware technology, that will be filled by Alex Kauer, currently a general manager in IBM's Microelectronics Division.

Licensed broadband PCS gets out of the gate

■ A Bethesda, Md., subsidiary of American PCS, L.P. (APC) — one of the two broadband personal communications services licensees for the region surrounding Baltimore and Washington, D.C. — last week became the first such license holder to launch its service. APC is an affiliate of the Sprint Telecommunications Venture, which comprises Sprint Corp. and three cable television companies. APC's service is called Sprint Spectrum. It includes a palm-size handset that combines a portable telephone, text pager and answering machine in a single device.

AT&T to slim down

■ AT&T last week offered buyouts to a whopping 77,800 managers in an effort to get volunteers for an expected downsizing of about 20,000 employees. If the carrier does not get enough volunteers by Dec. 29, it may begin handing out pink slips in January. Analysts remarked that AT&T has some room to cut without affecting service, so long as the most skilled managers remain onboard. "AT&T has product managers for products that, at other carriers, would just be considered features," said Mark Langner, a senior consultant for TeleChoice, Inc. in Verona, N.J.

Java hits the spot for National Semiconductor

By John Cox

Santa Clara, Calif.

In one of the first commercial Java success stories, National Semiconductor Corp. has used the hot new programming language to salvage a flagging World-Wide Web project intended to help electronics designers access and search the company's vast parts databases.

National will launch the application next month, and Java creator Sun Microsystems, Inc. is touting it as a major coup. Sun is pushing to have Java become the de facto standard for building the next generation of Web applications.

Web applications today typically support sets of documents that end users download. With Java, a program is automatically downloaded with the Web page to the local client computer. This turns the Web infrastructure into a true client/server medium for running real business applications instead of merely a storehouse of static documents.

National is relying on the technology to simplify the lives of electronic systems designers. Usually, these designers juggle thick paper catalogs looking for the information they need to select the appropriate integrated circuits for new products, said Rick Brennan, manager of World-Wide Web services at National's Santa Clara, Calif., headquarters. The catalogs are bulky, typically six to nine months out of date, and users have to learn parts numbering schemes to get through them.

What the designers really needed, and what Brennan set out to build, was a way to use PCs to describe their needs in terms of such criteria as desired performance, power consumption and temperature ranges.

The solution was an object-oriented search and retrieval engine from Cadis, Inc. in Boulder, Colo., that lets users query data in this way — what Cadis officials call a "guided, interactive search." But it was Java that made it possible to run the engine in the Web environment.

"To do this [kind of query] with a relational database, I would have to cobble together a complex SQL query going over multiple tables and doing multiple joins," said Janet Eden-Harris, director of marketing at Cadis. "And trying to do this over the Web, with its network latencies, is unworkable."

That's because the HyperText Mark-up Language (HTML) with which Web pages are created is sessionless, Brennan said. Traditionally, an application session maintains a context of information and actions as the user works through a process. "We were having a hell of a time," Brennan said. "This idea of a 'guided, interactive search' is very difficult to do in HTML."

National and Cadis learned about Java at about the same time and at once saw its potential: Java downloads not pages but applications, which can sustain a networked session by using remote procedure calls to server processes.

As a general-purpose programming language, Java can be used to write client or server programs. It has built-in security features and runs on multiple operating systems. The downloaded applet can be a simple animator, a full-blown spreadsheet or a complex three-dimensional modeling program.

"It's well thought out, solid, fairly easy to write and easy to learn if you have a solid C/C++ background," said Sam Pendleton, senior member of technical staff at Cadis.

Cadis developers did a crash rewrite of the search engine's client in Java and renamed it Krakatoa (the famous volcano near the island of Java).

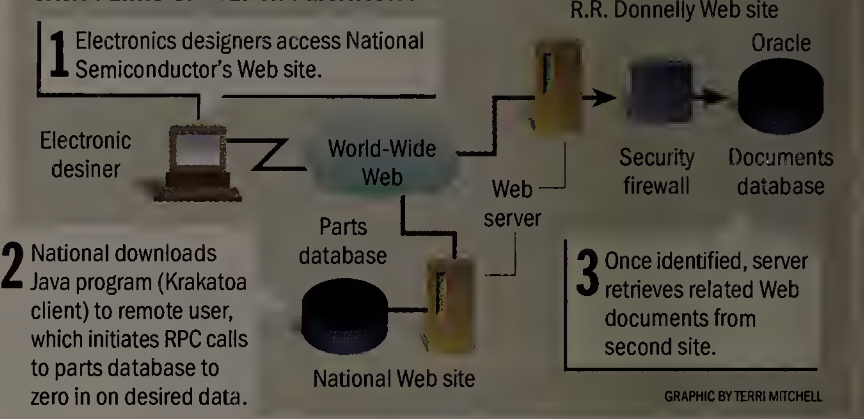
Now electronics designers will log in to National's Web site, download the Krakatoa client and begin searching National's database of 30,000 parts by working their way down through a graphical, hierarchical product tree or by simply inputting performance criteria.

At any point, the application can link to the relevant technical documents, which are stored at a separate Web site maintained by R.R. Donnelly & Sons Co. in Chicago.

National's next step will be to add a button to the Java applet that designers will click on when they have made their product selection. The button will activate a program that will let designers order sample parts, which would be delivered within two days.

"The whole point is, how do we make this process as painless as possible?" Brennan said. "This changes the whole way we talk to our customers." ■

JAVA PERKS UP WEB APPLICATIONS


1 Electronics designers access National Semiconductor's Web site.
Electronic desiner
World-Wide Web
R.R. Donnelly Web site
Oracle
Web server
Security firewall
Documents database
Parts database
National Web site
2 National downloads Java program (Krakatoa client) to remote user, which initiates RPC calls to parts database to zero in on desired data.
3 Once identified, server retrieves related Web documents from second site.

GRAPHIC BY TERRI MITCHELL

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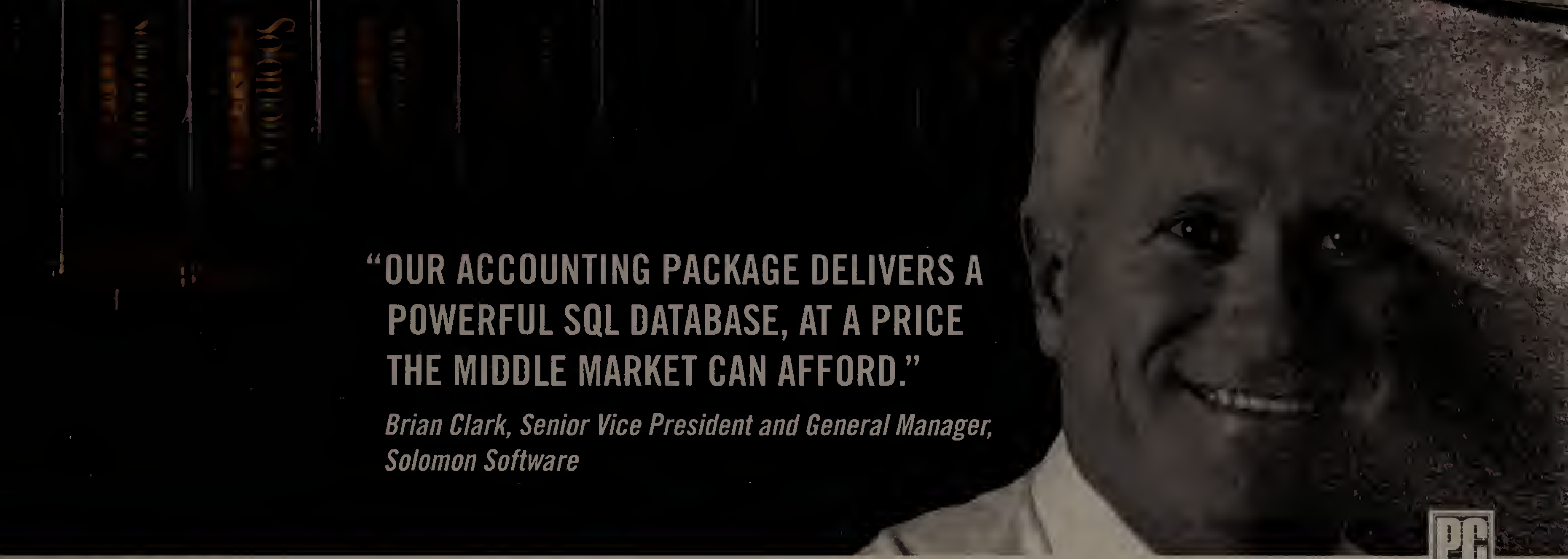

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Vern Strong, Vice President of Systems Development, Solomon Software

Circle Reader Service #26

IBM CICS up management heels

By Michael Cooney
New York

Users looking for easier ways to control, monitor and automate activities within distributed CICS environments will get some help this week when IBM introduces a new, more powerful version of its CICSPlex System Manager.

CICSPlex System Manager for MVS/ESA Version 1 Release 2 adds a variety of automation functions which are designed to let users more easily automate day-to-day chores and restart failed CICS transaction processing applications.

Other new features will give the platform the ability to manage distributed "CICS for OS/2" resources and the capacity to store information in IBM's object-oriented management repository, NetView Resource Object Data Manager (RODM). These features will help users automatically gather and act on information from distributed CICS systems as well as graphically represent them on a single NetView Graphical Monitor Facility (GMF).

IBM said it will add in a future release the ability to manage its other distributed CICS applications on AIX and Windows NT platforms.

CICSPlex is an MVS management application that, among other things, helps balance the workloads of multiple CICS "regions" within a single mainframe or in a distributed environment. It also monitors the performance of CICS applications, and if response times or throughput drops below user-defined thresholds, it send alerts to the mainframe's NetView network manager.

"The features we've added fill in a number of gaps in the current release and are critical for users to ensure the availability and performance of the applications that are essential for their day-to-day business activities," said Geoff Sharman, strategic marketing consultant with IBM.

To help users more efficiently run their CICS environments, IBM added a new API to the CICSPlex application that lets it tap automated capabilities in NetView. If a CICS region fails, CICSPlex can work with NetView automation facilities to fix the problem or page an engineer. Today, NetView would be aware of the problem but could not act on it.

"There is now a correlation between the automated network management capabilities of NetView and the systems management features of CICSPlex," said Eric Bodger, technical team leader for CICSPlex.

The API also allows users to kick off other tasks, such as activating a batch job, and work with automation applications built around COBOL and REXX languages.

Users can enable automated transactions and update multiple CICS regions with this support, Bodger said.

"There are over 20,000 licenses of OS/2 for CICS, and those users needed a way to ensure the reliability and performance of those applications."

To get a better handle on distributed CICS environments, users can now manage the work being done on CICS for OS/2 workstations and servers.

"There are over 20,000 licenses of OS/2 for CICS, and those users needed a central way to ensure the reliability and performance of those applications," Bodger said.

Now users, from a single point of control, can distribute CICS workloads among multiple OS/2 for CICS servers and monitor their status.

For heavy processing or application development, CICSPlex also lets users group multiple distributed servers as one unit to form a single system image, just as it does on a mainframe with multiple CICS regions.

CICSPlex System Manager requires an OS/2 for CICS agent in each server to pass data along to the central application.

Clients linked to the servers need not run the agent code, which is part of the CICSPlex package that users download to servers upon purchase.

The new package also makes it easier for users to store and track CICS resources by adding support for the RODM database. Using an application called MultiSystem Manager, CICSPlex automatically gathers informa-

See **IBM,** *page 10*

Vendor trio expected to ship multi-OS PowerPCs next year

By Peggy Watt
Las Vegas

The PowerPC vendor troika last week announced availability of a technical specification that will enable PCs to run multiple operating systems out of the box, but users must wait about a year to buy such machines.

The first PowerPCs based on the Microprocessor Common Hardware Reference Platform (CHRP) spec will appear in late 1996, with symmetric multiprocessing systems expected in the first half of 1997, according to Joe Guglielmi, general manager of Motorola, Inc.'s Computer Group.

Other partner companies in the PowerPC Alliance, IBM and Apple Computer, Inc., offered the same general time frame. IBM will move all its PowerPC systems and the RS/6000 line to the CHRP spec in the second half of 1996, said Anthony Santelli, general manager of IBM Power Personal Systems. "It takes time for us to execute the vision," Santelli said.

IBM expects to begin beta-testing OS/2 for PowerPC this year and to ship it in the first quarter of 1996.

The first implementation of the MacOS on a CHRP system may not be on Apple hardware, acknowledged David Nagle, Apple's senior vice president for research and development.

"We will have [MacOS for CHRP] available when the hardware starts shipping," Nagle said. He said the first CHRP-based Macintosh systems would appear next year but declined to give further details. Apple has shipped one million PowerMacs and is switching its entire line to the RISC-based PowerPC chip.

Other hardware vendors may indeed take up the slack. Radius, Inc. and Power Computing Corp., the first licensees of Apple's MacOS, as well as UMAX Data Systems, Inc., Zenith Data Systems Corp., FirePower Systems and a handful of peripheral vendors said they hope to release CHRP-compliant PowerPC products next year.

Besides IBM's OS/2 and Apple's MacOS and next-generation operating system code-named Copland, CHRP machines are expected to support a variety of operating systems.

For example, SunSoft, Inc. announced plans to supply Solaris on CHRP, Microsoft Corp. will support the platform with Windows NT, and Novell, Inc. has expressed interest in porting NetWare. The Microsoft Windows 95 operating system will not run on CHRP systems without modification, but applications written to the Win32 specification can be recompiled to run on Windows NT and CHRP. Fortunately, many Windows 95 products are already NT-compatible.

The CHRP spec includes the PowerPC platform technical specifications and enhancements, essentially providing the BIOS information the PowerPC had lacked to ensure integral multiple operating system support. It was announced at Comdex/Fall '94. ■

Canadian ISPs: Bell too bullish about Internet

By David Rohde
Ottawa

A group of Internet service providers is charging Bell Canada with threatening their survival by, in effect, denying them access to new Centrex lines that the public uses to access Internet gateways.

The reason? Bell wants to take over their market, the companies claimed.

The Internet service providers from Quebec and Ontario are filing a petition with the Canadian Radio-television and Telecommunications Commission (CRTC) to prevent Bell Canada from raising rates for Centrex III lines. The service providers claimed the hike amounts to rates tripling.

The hike could mean that corporate and residential Internet users will see their costs soar, said officials with the Internet service providers.

"Individual line rates will increase from $25 to $30 per month to as much as $90 monthly," said Jean Louis Bouthillete of Internet Login.

Bell Canada did not respond to a request for comment.

Internet service providers in Canada may be particularly reliant on Centrex lines to avoid buying private branch exchange systems that customers would dial in to for their Internet gateways, said Tom Brennan, a senior consultant with TeleChoice, Inc. in Verona, N.J.

North of the border

Facts about Internet usage in Bell Canada's service area of Quebec and Ontario:

- Total number of Internet users: 500,000
- Number of Internet service providers: 150
- Number of subscribers to Internet service providers: 300,000
- Growth rate of subscribers to Internet service providers: 10% per week

SOURCE: INTERNEX ONLINE, TORONTO

Bouthillete and others alleged that Bell Canada is attempting to clear out the independent Internet service providers in its service territory of Quebec and Ontario in preparation for introducing its own Internet access service.

"We are a fledgling industry, and now that we have pioneered the technology and have developed the market at significant expense, Bell wants to take over," said Rory Olson, president of Montreal-based Access Internet, in a written statement.

The CRTC recently has undertaken regulatory initiatives that, as in the U.S., have the initial effect of lowering long-distance rates while raising local rates.

The Internet service providers acknowledged that some of them recently received a letter stating that Bell Canada will not increase rates on existing services for six months, but that they will begin charging the higher tariffs immediately on any new lines ordered. But labeling that move a smoke screen, the Internet service providers said that other Internet service providers have had requests for new Centrex orders turned down.

Bell Canada has a reputation as a ferocious defender of its market share, despite the CRTC's liberalization moves, Brennan said. In fact, "the regulators have been pretty favorable to Bell" on allowing Bell Canada to continue to set high access rates, he said.

The Internet service providers' request for help is likely to get bogged down in legal wrangling, Brennan added. "What they're looking at is two years of petitions going back forth, and by then, they'll be out of business," he said. ■

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Circle Reader Service #27

Group goes with flow to publish client API

Also, Microsoft moves ahead on workflow hooks for MAPI.

By Barb Cole

Redmond, Wash.

Two powerful forces in the workflow arena — an industry consortium and Microsoft Corp. — are moving ahead with plans to ease deployment of workflow systems across the enterprise.

The Workflow Management Coalition, an industry group of workflow vendors and users, this week will roll out Interface 2, a client application interface for linking new and existing applications to workflow engines.

And Microsoft last week hosted a meeting near its headquarters here to update about 30 workflow providers on the status of workflow hooks the company is adding to its Messaging Application Programming Interface (MAPI).

The MAPI hooks, which are not meant to compete with the coalition's standards, will let users exchange information between workflow engines and MAPI-enabled applications, such as electronic mail systems.

Both developments are seen as key to more widespread adoption of workflow.

Workflow systems enable users to integrate several applications around core business processes. Interface 2 is a set of calls that developers can use to activate services provided by workflow engines.

These services, which may be incorporated into new or existing applications, will let users perform basic workflow functions from within traditional applications.

These functions include building work lists, generating queries against a workflow engine, and completing workflow tasks and some administrative capabilities, according to Raul Medina-Mora, chairman of the Interface 2 working group.

The interface is key because, without it, developers must construct specialized applications for workflow engines. Using the interface, companies can more easily add workflow capabilities to applications.

Future standards are on tap that specify how workflow processes are defined, how workflow invokes other applications and how disparate workflow engines can share information.

A detailed MAPI

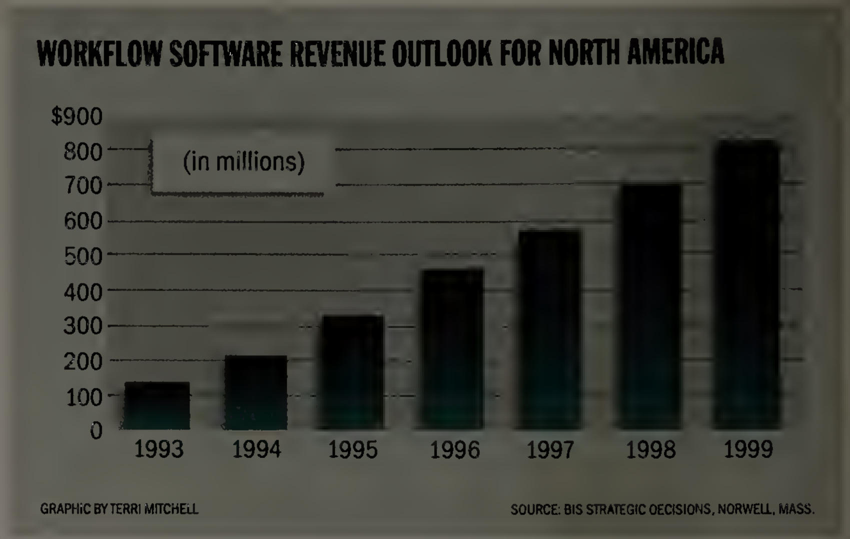
On the MAPI front, Microsoft is expected to detail its plans for the workflow extensions and solicit feedback from workflow vendors. Microsoft confirmed plans for the meeting but declined to comment further. Sources familiar with the development of the MAPI workflow hooks said the specification will not roll out until after the release of Microsoft Exchange, now due in the first quarter of 1996.

Users welcome any news about making workflow easier to integrate with other resources.

"We might have accounts payable in one workflow system, but our construction department uses another. In those circumstances, you can't share data between them," said Ed Glister, a senior project manager at Consolidated Edison Company of New York, Inc., which uses workflow software from Wang Laboratories, Inc. as well as a FileNet Corp. workflow package.

Connie Moore, director at BIS Strategic Decisions, a market research firm in Norwell, Mass., said the emerging standards are "extremely positive because [they] level the playing field for the smaller workflow vendors." ■

WORKFLOW SOFTWARE REVENUE OUTLOOK FOR NORTH AMERICA



GRAPHIC BY TERRI MITCHELL

SOURCE: BIS STRATEGIC OECISIONS, NORWELL, MASS.

Survey says local service hits the skids

By Tim Greene

New Orleans

State regulators have ferreted out which local exchange carriers (LEC) are letting service faulter as the LECs strip down to brawl for their chunk of local telephone loops.

Preliminary results from a survey of states show that four LECs — Ameritech Corp., GTE Corp., NYNEX Corp. and US WEST, Inc. — are under investigation for questionable service quality (see graphic).

Problems identified in the complaints include delayed installations, missing repair commitments and billing problems. Perhaps most importantly, this study quantifies what had been described anecdotally (*NW,* Aug. 7, page 1).

The state investigations are run by the individual state public utilities commissions (PUC), which, in some cases, can demand specific service levels and impose fines if carriers fail to meet them.

The National Association of Regulatory Utility Commissioners (NARUC) meeting here last week plans to recommend benchmark service levels that all users can expect. It would, however, be up to individual states to decide whether to adopt them.

Despite corporate rhetoric, layoffs have not been good for business. The study finds that of the 27 states that reported staff reductions by their LECs, 24 reported that the number of service quality complaints has increased since those reductions.

NARUC has already published recommended standards for technical quality.

Recommendations based on this survey will focus on service to users and response to their complaints.

Whether or not the survey presents an accurate picture, service quality is only going to get worse, predicted Robert Rosenberg, president of Livingston, N.J.-based Insight Research Corp., a telecommunications market research firm.

As competition is allowed in the local market, network investments will be more influenced by quarter-to-quarter revenues, rather than the 15- to 18-year capital investment scenario that the monopoly LECs followed.

"The RBOCs and GTE dominate the local market and have maintained standards of quality," Rosenberg said. "It's not clear to me that in a wide-open market where the customer buys on price that those standards will be upheld. Service quality is just bound to degrade."

In polling PUC staffs throughout the country, NARUC found that getting a grip on how to maintain service quality in a deregulated market was the No. 1 priority.

As a companion research project, NARUC is comparing regulatory measures individual states have taken to promote better quality of service to see how well they work.

The successful ones will be recommended to NARUC for possible implementation.

The final results of the survey are due at NARUC's February meeting. ■

Quality check

Various state regulators are checking out the service quality of four major local exchange carriers.

Carrier	States
Ameritech	Illinois, Ohio
GTE	Arkansas, Hawaii, Missouri, North Carolina
NYNEX	New Hampshire (informal investigation), New York, Rhode Island
US WEST	Arizona, Colorado, Idaho, Iowa, Minnesota, Montana, Nebraska, Oregon, South Dakota, Utah, Washington

SOURCE: NATIONAL ASSOCIATION OF REGULATORY COMMISSIONERS, WASHINGTON, D.C.

Saros document manager meets the Web

Saros Corp. last week rolled out a version of its document management software for retrieving and managing documents across the World-Wide Web.

The software, dubbed @mezzanine, frees Web administrators from having to delete old documents as they are revised. The software's built-in version control ensures that Web documents are up-to-date, Saros officials said.

"It's still painful setting up a Web server," said Jim Meyer, vice president of marketing at Saros. The new product will help by providing location services and security not usually found on Web sites, he said.

"The package consists of a document management engine that runs on Unix, Windows NT and OS/2, as well as a client interface that runs on Windows, OS/2, Macintosh and Motif.

Rich Duncan, manager of technology assessment at Frank Russell Co., a financial services firm in Tacoma, Wash., already uses Mezzanine and is eyeing the Web-enabled version for a set of applications for both internal and external use.

"The software has the potential to be valuable because it gives you the added security and version control you're used to in a production environment," he said. "Yet it's linked to a home page."

Analysts said the software could be useful for firms using the Web for document publishing.

Pricing was not available for @mezzanine, which will ship next month.

Saros: (206) 646-1066.

By Barb Cole

IBM

Continued from page 8

tion about user-defined CICS resources and puts them in the object-oriented RODM database. Objects in the database are graphically represented on GMF.

"For the first time, users will be able to monitor the end-to-end status of their CICS systems and network links and devices in between those systems — all on one screen," Bodger said.

Analysts said the new features would help many large users more easily run a more important part of their enterprise.

CICSPlex 1.2 will be available Dec. 22. New pricing was unavailable, but the existing product costs $500 per processor plus an additional $110 per CICS region.

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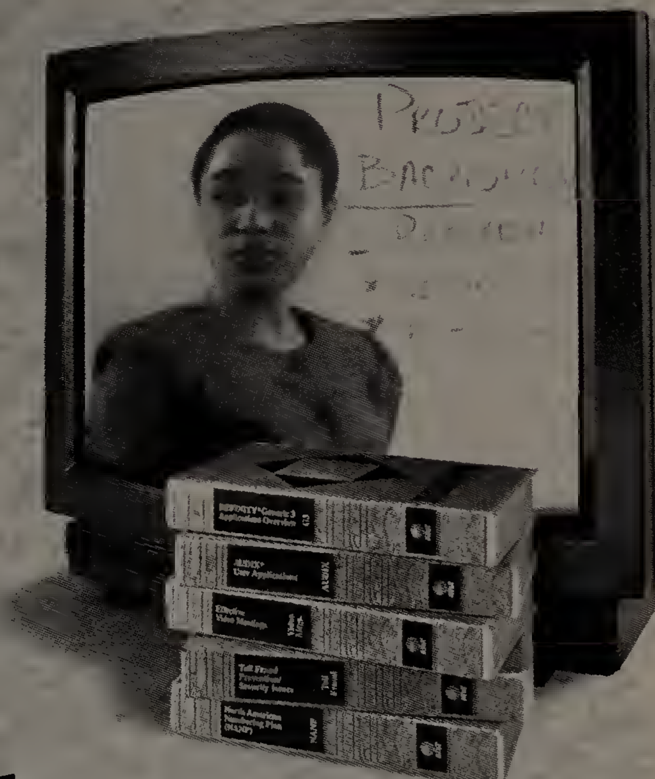

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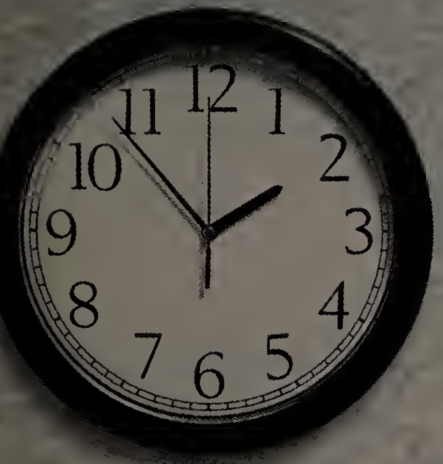

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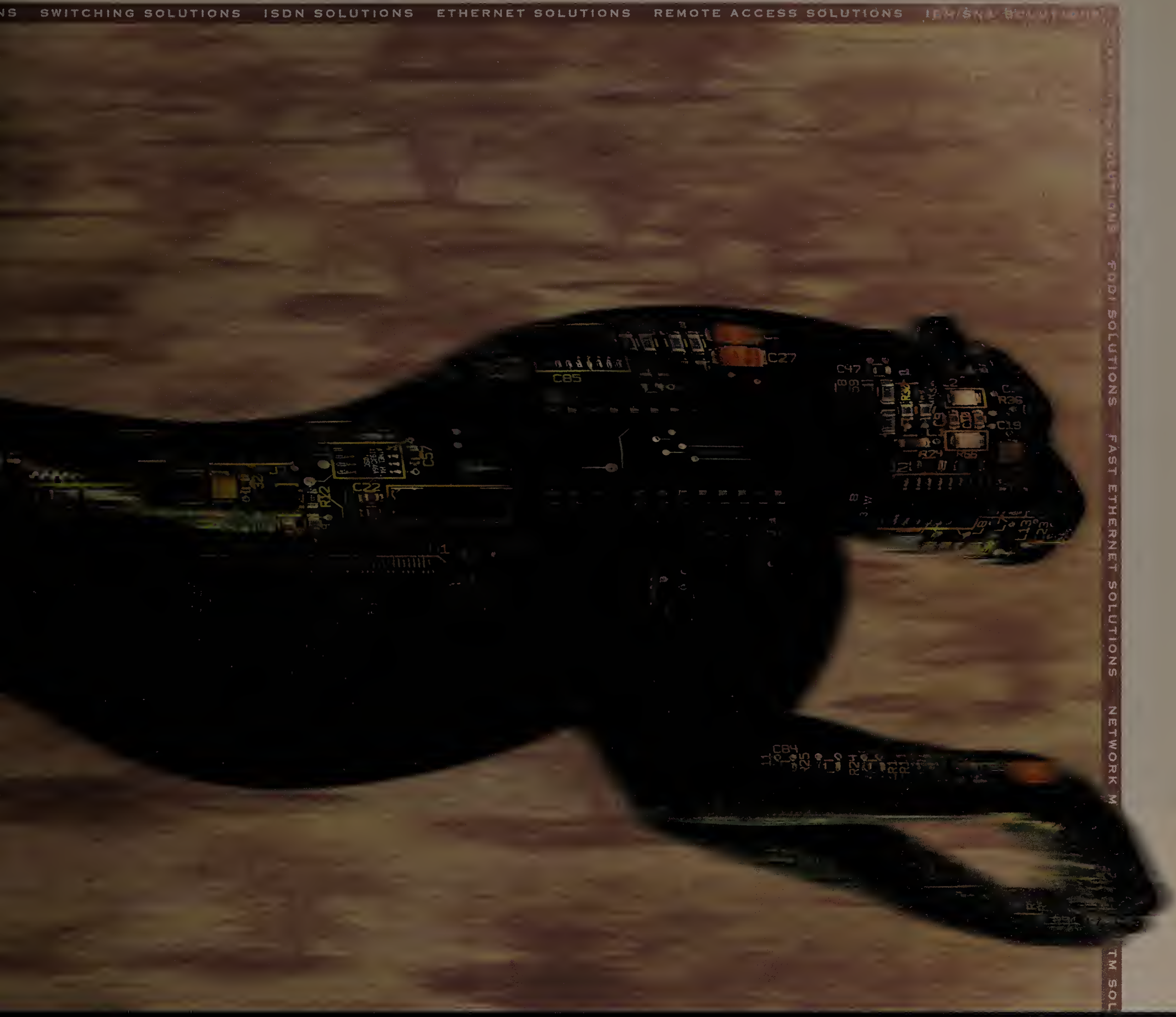
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*Circle Reader Service #***30**

Vistium benched as AT&T pitches Intel

By Joanie Wexler

Basking Ridge, N.J.

The AT&T Vistium conferencing line has become a casualty of AT&T's recent decision to divide into three companies — a move that left its Global Information Solutions (GIS) division out in the cold.

The orphaned GIS will discontinue development of its Vistium desktop conferencing systems, which are based on GIS-made Globalyst PCs. GIS, which is for sale, will support the products through year-end, sources said.

To soften the blow, AT&T last week launched a promotion to help Vistium customers move to Intel Corp. ProShare desktop conferencing systems.

Vistium customers that sign up before April 15, 1996 will get price breaks on the ProShare systems, free monthly WorldWorx Network Services subscriptions and 30 minutes of free use through Oct. 15, 1996. AT&T also will waive the WorldWorx $50 startup fee.

There are about 6,400 Vistium systems installed today, according to industry figures.

AT&T has not yet struck similar deals with any of its other end-point partners, which include Apple Computer, Inc., IBM and Sun Microsystems, Inc. But WorldWorx Vice President Ernie DeNigris said he suspects such marketing arrangements will emerge.

"Intel is the furthest ahead with supporting voice, video and data conferencing," said Ernie DeNigris.

Giving users the option to move to the Intel platform happened first, he said, because "Intel is the furthest ahead with supporting voice, video and data conferencing."

To date, Vistium is the only WorldWorx-supported conferencing system that allows voice and video capabilities.

Vistium was one of the top three conferencing system sellers last year, according to Elliott Gold, a conferencing consultant and president of Telespan Publishing Corp. in Altadena, Calif.

Gold noted that the Vistium discontinuation is represents a second WorldWorx development hit for AT&T, which only last July rolled out Version 2.0 of its Vistium Personal Video Software amid much fanfare. The Vistium 2.0 software is the version that adds data conferencing capabilities.

And last year, when partner Intel was sticking to its guns and supporting a proprietary video compression algorithm called Indeo, in favor of the standard H.320 scheme, AT&T sank a lot of effort into developing translation services between H.320 and Indeo. That time and money has largely gone by the wayside since Intel has jumped on the H.320 bandwagon.

"WorldWorx has been up at bat for awhile and now has two strikes against them," Gold said, referring to the ill-fated Vistium and translation services efforts.■

MCI calls for better conferencing

By Joanie Wexler

MCI Communications Corp.'s conferencing services will gain sophisticated application sharing in the third quarter of next year, *Network World* has learned.

What is the difference between application sharing and what is commonly known as whiteboarding, you may ask.

Whiteboarding services allow users to collaborate on a common document in real time with synchronized keystrokes and a common view of the annotated image. They are already available from MCI in a point-to-point scenario among users running systems equipped with DataBeam, Inc.'s FarSight conferencing software.

Multipoint whiteboarding services are set to launch in January, said Tim Reedy, networkMCI Business' vice president of finance and marketing.

The limitation with whiteboarding is that documents can be imported into the whiteboard from any program but cannot be exported back to a user's PC.

If users want to do anything with the shared document after the electronic meeting, they would have to recreate the document, Reedy said.

Application sharing, on the other hand, will allow an altered document to be saved to any or all participants' PCs when they are through with it, explained Sarah Dickinson, program director at Personal Technology Research, Inc. in Waltham, Mass.

Desktop conferencing timetable

Capabilities available...

- **Now:** Multipoint videoconferences among H.320-compliant systems and single-vendor proprietary systems; point-to-point whiteboarding
- **January 1996:** Document conferencing with audio
- **Q3 1996:** Application sharing with audio

MCI's multitiered conferencing strategy has come out in bits and pieces over recent months through a slew of announcements under the networkMCI Conferencing umbrella. Because the disclosures have been so scattered, users have ended up a bit stymied as to what services are available and what is coming when (see graphic).

In a nutshell, MCI users can run multipoint videoconferences among systems compliant with the H.320 standard for video compression today. Also available from MCI now are audio-only conferences and the point-to-point whiteboarding.

MCI's video offering requires ISDN. However, its audio and whiteboard conferences will run over the public switched telephone network, said Matt Collier, senior manager of conferencing marketing at MCI.

MCI's data conferencing services are based on the T.120 standard for switching data conferences. But T.120 is still not nirvana, according to a major financial user who asked not to be identified.

"The problem with T.120 is that it's very slow if you enter the conference late," he said. "You don't join the whiteboarding session at the point where everybody else sees it. Instead, the application has to scroll through each frame of the application to get [caught] up to where everybody else is."

Senior Washington Correspondent David Rohde contributed to this story.

Thinking Machines brainstorms, comes up with clustering tools

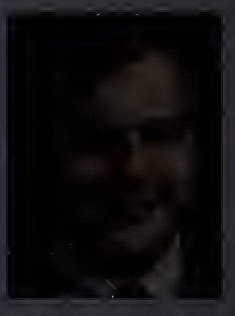
New GlobalWorks to let servers, clients operate together.

By Ben Heskett

Bedford, Mass.

A company best known for massively parallel supercomputers is applying its experience to boost the power of today's servers through clustering, an effort that has already gained Sun Microsystems, Inc.'s endorsement.

Thinking Machines Corp. is developing GlobalWorks, a middleware offering that will enable multiple server and client machines to work in unison to process applications faster.



"[The software] tries to optimize the utilization of your computing resources..."

Jacek Myczkowski

Although GlobalWorks will be able to accommodate existing Unix applications, software must be built from scratch or modified to take advantage of its parallel-processing attributes. Tools for both are available within the software, which will come in client and server clustering versions.

In that respect, GlobalWorks is more of a development environment than anything. It includes compilers, debuggers and a run time system.

The first target for the tool, set to ship next March, is Sun's Solaris platform.

Sun will announce a partnership with Thinking Machines at the Supercomputing '95 conference in San Diego in the first week of December. Initially, GlobalWorks will be offered in conjunction with the Solaris operating system and Sun's recently announced Ultra server line.

But Jacek Myczkowski, Thinking Machines vice president of technology and development, said his company hopes to have Windows NT and NetWare versions in 1997. The client version of GlobalWorks is expected to debut in third-quarter 1996.

With GlobalWorks, a network administrator can delegate the CPU capacity for specific tasks. That means that if there are 16 nodes available, a manager can sit at his console and partition eight nodes to complete a large task, four nodes to complete a smaller task and two nodes for other tasks.

That way, a net administrator can not only control the network from the console, but also the computing and I/O resources. A network spanning several floors of a Fortune 500 company can therefore be seen as a single computing unit if necessary.

This is what separates the product from others, such as Isis Distributed System, Inc.'s Isis Reliable software developers' kit, analysts said.

"Other vendors [such as IBM and Hewlett-Packard Co.] have pieces of it, but no one has the overall integrated solution," said Debra Goldfarb, an analyst with International Data Corp., a Framingham, Mass.-based consultancy.

The server version of GlobalWorks will allow corporate developers to look at the clustering environment and recognize how best to delegate the power available. The client version has the same capacity, so if a workstation needs more power to complete a task, it can reach across the network and pluck extra CPU power from other GlobalWorks-equipped workstations.

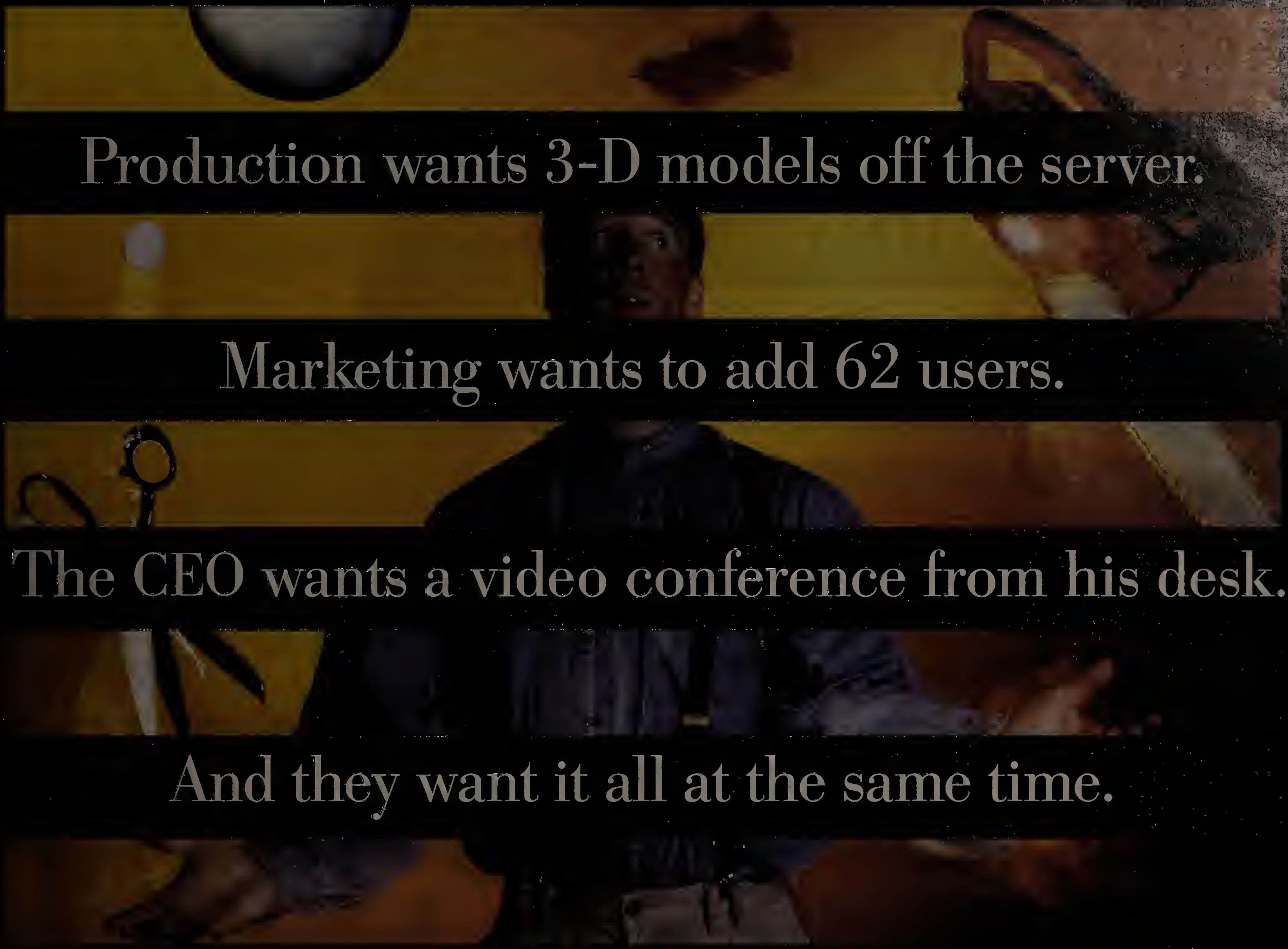
If what the company is planning takes hold, the high-end of the network computing industry could be turned on its head. "This [will be] the Holy Grail in the industry" if Thinking Machines is successful at putting this kind of clustering technology in a server, Goldfarb said.

"It's a significant industry step; it's not just a new product. It's a major evolution in people's

See **Thinking Machines,** *page 72*

CORRECTION

A graphic with last week's page 1 story on Windows NT mislabeled figures on the number of NT servers that have shipped. The figures actually represented the cumulative total of NT workstations and servers shipped during the last three years. A total installed base of NT servers is about 400,000, according to IDC in Framingham, Mass.



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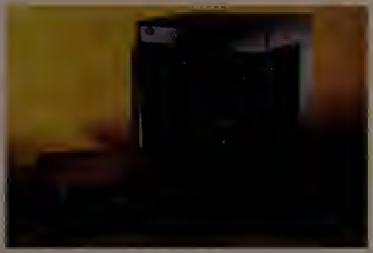

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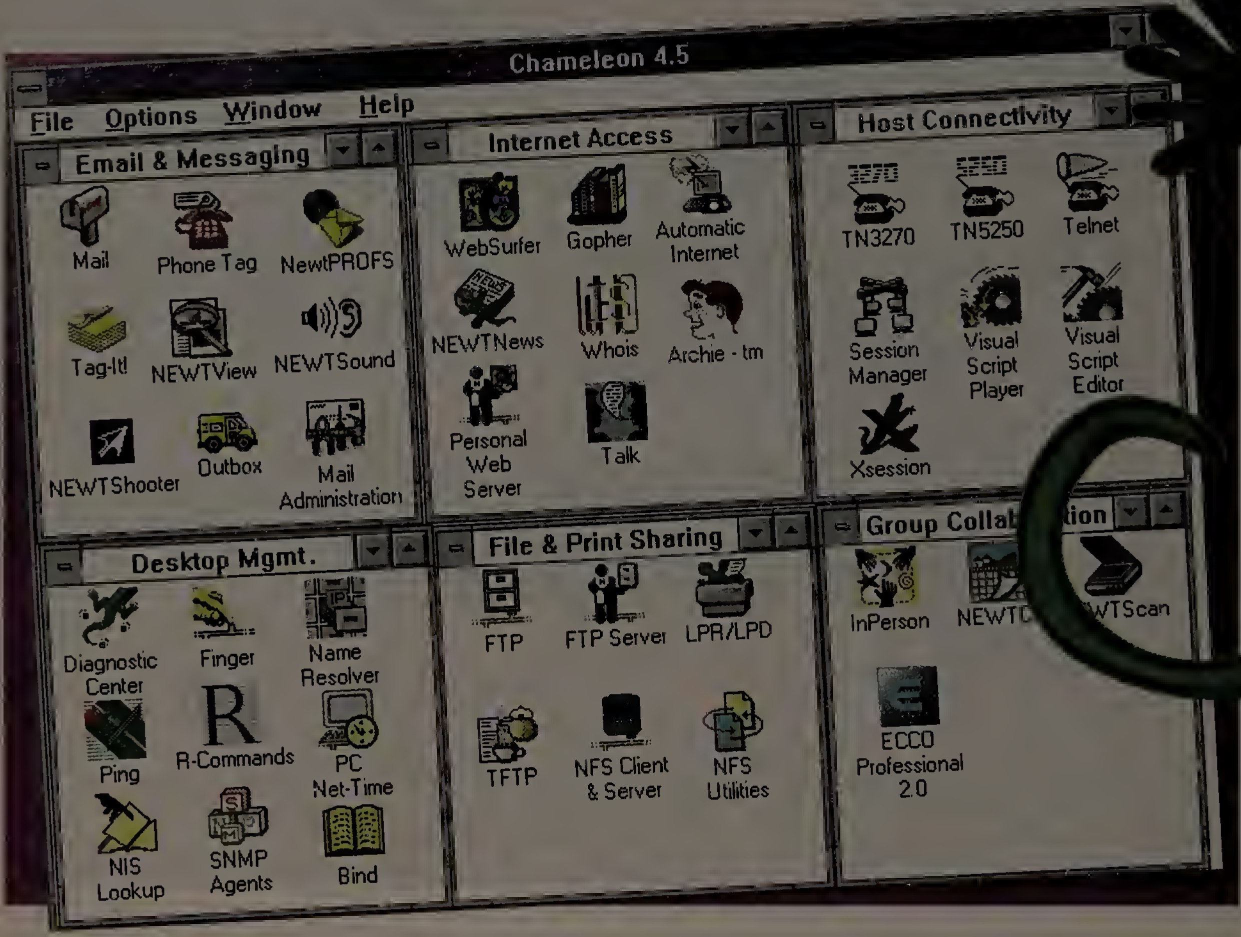

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When it comes to your purchase decisions, control and flexibility should be the determining factors. After all, whose network is it anyway? With Stakit, you will be abl to easily share your expensive equipment, optimize your network resources and give bac to your overextended budget. After all, sharing should be easy and cost effective.

Switchex™ allows you to make physical moves, adds and changes electronically. It is comprised of a hardware switch module and real-time database software. This combination gives Switchex the unique ability to make connections, electronically while automatically maintaining an updated database of connections, thereby eliminating the need to physically rewire. In addition, Switchex can be combined with other NHC products to provide total network integration and control.

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WireMan for Workgroups effortlessly manages your network and its cables. It integrates the logical and physical layers with an easy to use graphical user interface. With just a click of the mouse, WireMan traces all cable connections, redirects signals in conjunction with NHC's smart switching technology and performs moves, adds and changes. The power of WireMan rests in its ability to monitor MIB values, diagnose network hazards and fix problems electronically by issuing SNMP commands.

Connectivity

NHC Communications designs and manufactures integrated network and cable management products for the IBM AS/400 user under the NHC/MuxLab brand name. Over the years, the company has broadened its product offering to include powered wiring hubs, signal repeaters, multiplexers and electronic crosspoint switches.

▶ ***TwinStar*** products are wiring hubs that provide centralized star cabling for the AS/400 via twisted pair cable (STP & UTP). They eliminate problems inherent in the traditional daisy-chain and passive-star cabling techniques such as limited distance and user disruption.

▶ ***TwinMux*** is a product for growing AS/400 systems that need to connect host computers to users in adjacent buildings. It is an eight-port multiplexer that combines eight host ports over a single fiber or UTP, thereby simplifying the job of connecting remote users in a campus environment and making more efficient use of the cable runs between the buildings.

▶ ***TokenEase*** products deliver a range of solutions for single token ring connectivity via UTP, Type I or fiber-optic cable in the 4/16M Token Ring environment. NHC's passive and active systems, Jitter attenuators, ring and lobe products allow your Token Ring LAN to be expanded for increased flexibility.

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WANs & Internetworking

Covering: Network Architectures • Net Management • Mobile Computing
Local/Long-Distance Services • Routers • Muxes and other CPE

Briefs

■ *Last week,* **NetManage, Inc.** *introduced NewtWatch, a Windows application that will enable users to run a set of* **desk-**
op management applica-
ons, *such as software*
istribution, remote backup and
ain management capabili-
es, from a central location.
NewtWatch is Simple Network
anagement Protocol-based soft-
are that allows real-time moni-
ring of software activity using
PC Management Information
se to poll data. It displays
ta graphically and lists an
dividual's logon, the applica-
n running, and the time and
ration of the given applica-
n. It can also track software
enses.
NewtWatch 4.6 is available for
95. Existing users can upgrade
$95.
NetManage: (408) 973-7171.

Cayman Systems, Inc. *has*
veiled a **remote access**
rver *for workgroups, small*
sinesses and Internet service
viders. Called Marina 130, the
rver provides three high-speed
rial ports and one Ethernet
rt, and supports PPP. It allows
CP/IP users to access electronic
ail, remote printing, file-
ansfer, file-sharing and telnet
oplications.
Marina 130 costs $995 until
arch 1, after which it will cost
,195. It is available 60 days
er receipt of order.
Cayman: (617) 932-1100.

■ **Netsys Technologies, Inc.** *has announced support for the Open Shortest Path First (OSPF) routing protocol in its* **net design** *and simulation tools. Support for OSPF lets users manage their OSPF-based Cisco Systems, Inc. router nets through the visualization, troubleshooting and what-if analysis capabilities of Netsys' Connectivity Tools.*

Connectivity Tools with OSPF support is available now at prices ranging from $7,500 to $15,000.

Netsys: (415) 833-7500.

Apertus boosts TCP/IP gateway

Company also turns its sights to managing IBM's MQSeries messaging environment.

By Michael Cooney
Eden Prairie, Minn.

Apertus Technologies, Inc. last week said it will roll out a more powerful TCP/IP-to-mainframe gateway and a new application designed exclusively to manage IBM's MQSeries messaging middleware environments.

The company will double the capacity and add improved SNA communications support to its DataStar LAN-to-mainframe gateway. This will allow for greater host connectivity options and better throughput, the company claimed.

The MQSeries application, called MQView, will let users monitor the performance, queues and other MQSeries-based vital signs necessary to keep the distributed environment up and running.

Network World Fusion THERE'S MUCH MORE ON-LINE, INCLUDING:

- An IBM paper that details how MQSeries works.
- A look at Apertus' DataStar software.
- Articles explaining how IBM plans to extend MQSeries.

Link to http://www.nwfusion.com. From the main menu, select News+ then WANs and Internetworking.

For DataStar, Apertus will double to 5,000 the number of mainframe application sessions the gateway can support. DataStar sits between the mainframe and downstream LAN-attached devices, and allows TCP/IP-based devices access to the host's resources.

The company also improved DataStar's overall performance by adding a Pentium processor option that can be upgraded in the field.

Users at AT&T American Transtech were particularly attracted to the increased session throughput. This feature allows them to link up more agents to the mainframe and get better response times than they could achieve in the past, according to John Veino, director of networking at the firm.

Apertus also added support for TCP/IP telnet sessions and the ability to run IBM LU 6.2.

"Users now have the ability to gain access to or deploy any SNA applications via 3270 or LU 6.2 sessions, as well as any TCP/IP host applications, all over a TCP/IP backbone," said Robert Gordon, chairman and chief executive officer at Apertus.

Analysts said DataStar should help users deploy client/server applications by keeping TCP/IP or LU 6.2 environments integrated with the mainframe.

"As companies deploy client/server applications, the

See **Apertus,** *page 18*

Company profile

Apertus Technologies, Inc.

Location: Eden Prairie, Minn.

Financial: $60 million in revenue, with 65% coming from network connectivity business, 17.5% from systems management products and 17.5% coming from data integration business.

Workforce: 400 employees in Minneapolis, New York and London

Primary products:
- ▶ DataStar, LAN-to-mainframe gateway
- ▶ MQSeries products such as MQView — a management application for the IBM MQSeries environment
- ▶ Data integration services and products, such its Enterprise Integrator, that link legacy applications with new client/server applications

History: Founded in 1989 as Lee Data Corp. Bought Systems Strategies, Inc. in 1992 and Blueline Software, Inc. in 1994.

Another CDPD fan accepts the analog network

By Joanie Wexler
San Francisco

Southwestern Bell Mobile Systems earlier this month became the latest CDPD proponent to throw up its hands and sanction the analog cellular network for all data applications.

Like several other carriers, Southwestern Bell Mobile originally pledged allegiance to Cellular Digital Packet Data packet switching services but is now beefing up the data carrying capabilities of its circuit-switched analog network while waiting for CDPD to take off.

The carriers are fortifying their analog cellular nets with modem pool services. Modem pools in the carriers' nets run wireless error-correcting protocols to improve the reliability of analog lines so they rival that of wired links. They accomplish this by continually monitoring the

See **Analog,** *page 22*

Router makers on a mission for high performance, low cost

By Jim Duffy

Two router vendors have unveiled products that allow users to route between virtual LANs and add internetworking capabilities to LAN servers.

RAD Network Devices, Inc. (RND) rolled out Vgate, a high-performance router for switched LANs and VLANs that distributes routing through the network. And Sourcecom Corp. brought out Incarda, a hardware-only routing card for servers that does not rely on the server CPU for processing.

The products are intended to address some of the more pressing issues in internetworking today: how to interconnect switched VLANs and cost-effectively add routing to other LAN functions without sapping performance.

RND's Vgate attempts to reconcile the first issue. The device is available in two- or four-port versions that interconnect Ethernet switches and route IP and IP packets among them at wire speed, according to RND. Vgate latency is less than 100 microsec, the company said.

Analysts said Vgate has an advantage over other VLAN routing products — if it can live up to its performance claims.

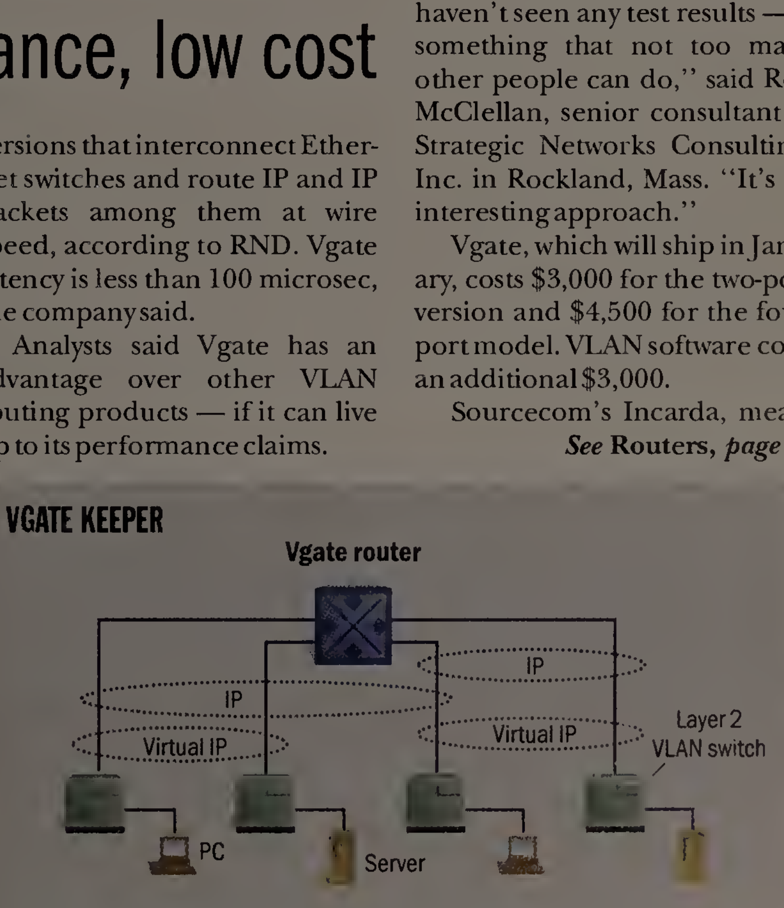
"Routing at wire speed — if that's what they can really do; I haven't seen any test results — is something that not too many other people can do," said Rolf McClellan, senior consultant at Strategic Networks Consulting, Inc. in Rockland, Mass. "It's an interesting approach."

Vgate, which will ship in January, costs $3,000 for the two-port version and $4,500 for the four-port model. VLAN software costs an additional $3,000.

Sourcecom's Incarda, mean-

See **Routers,** *page 18*

VGATE KEEPER



RND's Vgate is designed specifically to distribute VLANs' routing functions throughout the enterprise.

GRAPHIC BY TERRI MITCH

Network design

No BONeS about it, tool takes the guesswork out of switching

By Jim Duffy
Santa Clara, Calif.

Systems & Networks, Inc. last week added ATM and Ethernet switch modeling capabilities to its network design and simulation tools, enabling users to determine when and where to add high-speed switches to their network.

The so-called Asynchronous Transfer Mode and Ethernet switch libraries are add-on software modules to Systems & Networks' BONeS line of simulation products. They are intended to help users reduce the risks and costs of implementing new LAN architectures.

The modules, which run on Unix workstations, give users insight into the performance and behavior of several vendors' switches. The ATM library supports switches from Cisco Systems, Inc., Bay Networks, Inc. and Fore Systems, Inc., while the Ethernet library supports devices from Cisco, Bay and 3Com Corp. (see graphic).

With these modules, users can determine where switches should be located in the net, and how clients and servers should be placed around the switch, Systems & Networks officials said. They can also find out how much bandwidth is needed to meet application response time.

Speaking volumes

Systems & Networks' new ATM and Ethernet switch libraries support these products:

- Cisco LightStream 2020 and Catalyst, Grand Junction FastSwitch
- Fore AS-200
- Bay LattisCell and LattisSwitch
- 3Com LANplex

Also, the modules pinpoint bottleneck areas in the net by reporting performance characteristics of the switches, such as throughput, delay, memory utilization and packet/cell loss.

"We have had many good [experiences] with it in being able to model applications as they are being developed in the architectural phase," said Shawn Farshchi, manager of data networking services at DHL Airways, Inc. in Redwood City, Calif. "That saved us a decent amount of money in terms of what we expected bandwidth to be vs. what the reality was."

Analysts said users, in determining whether to purchase the BONeS software, have to balance the cost of the modules vs. just buying and testing a switch. At $7,500, the Ethernet switch library costs more than some Ethernet switches themselves.

"If I'm a network manager and I'm looking at a small bounded workgroup or departmental configuration, the question is, am I going to invest $6,000 to $10,000 to buy a switching product to figure out if it's best for these users?" said John Morency, a principal with The Registry, Inc., a Newton, Mass., consultancy. "In a lot of cases, I'm just going to buy the switch."

The ATM module costs $10,000. Both are available now.

©Systems & Networks: (800) 926-6373.

States to feds: Keep us in loop

Federal legislation mounts, but state regulators see their role as key to bringing about local phone competition.

By Tim Greene
New Orleans

State regulators meeting here last week said the pending wholesale overhaul of federal telecommunications law could squeeze them out of the picture and jeopardize the lower rates promised by truly competitive local phone markets.

DON'T HOLD YOUR BREATH

Congress has promised a new telecommunications law by Thanksgiving, but U.S. Deputy Assistant Attorney General David Turetsky told state regulators not to count on it. He says next year is more realistic.

"The goals will not be met or will be met less quickly [if the states] do not have control," said Cheryl Parrino, incoming president of the National Association of Regulatory Utilities Commissioners (NARUC), in pointing out flaws she saw in the federal legislation now being hashed out by a congressional committee.

The biggest threat to competition is that local markets will be declared competitive before they really are, and the incumbent local exchange carriers (LEC) — owners of the local-loop infrastructure — will muscle out smaller competitors.

Instead of the current regulated monopolies, the bill will create "consolidated, unregulated monopolies," according to Lisa Rosenblum, a commissioner at the New York Public Service Commission (PSC).

Giving the Federal Communications Commission too big a role could lead to rulings that lift regulation before healthy competition has a chance to mature, NARUC leaders said.

Congress has to decide whether to promote competition for its own sake or to use competition effectively to bring about lower rates and better service, according to Kenneth McClure, a commissioner of the Missouri PSC.

NARUC wants states to decide whether LECs have opened up their local markets to competition before the LECs are rewarded with permission to compete in the long-distance market.

In addition, state commissioners want to keep authority over all in-state telephone traffic.

The state regulators also want to regulate pricing and demand that LECs continue offering basic telephone service throughout their territories. Without those provisions, local competition will eventually come about anyway, Parrino said.

Large users are key to whipping the legislation into shape, according to Sharon Nelson, a commissioner of the Washington State Utilities and Transportation Commission. The big consumers of phone service generally agree that state regulation is the way to go and have political and financial clout, she said. ■

Apertus

Continued from page 17

need for greater session capacity and throughput for accessing information stored on the mainframe goes up," noted Rick Villars, director of network architecture research at International Data Corp. in Framingham, Mass.

On the other side of the Apertus house, the company is looking to help users get a handle on IBM's MQSeries environment.

MQSeries is IBM's queuing and messaging technology that eases application-to-application communication over any communication protocol. MQSeries lets applications communicate synchronously and stores messages in queues if the target application is busy or off-line.

IBM and Systems Strategies, Inc., which Apertus owns, signed a joint development and reselling agreement in 1992 to build and distribute MQSeries products.

MQView is a Simple Network Management Protocol-based application that can run on IBM's NetView for AIX or Hewlett-Packard Co.'s OpenView platforms.

The application comprises two parts: one piece runs on the central management box, while agent code is required on the distributed MQSeries clients. The agents were built by Apertus and do not conform to any industry-standard agent technologies.

The agents gather local information about the system — such as its location, configuration, status and, most importantly, how much data is flowing through or being stored in its queuing buffers. The data is then filtered and sent back to the central application, which, in turn, displays pertinent data on the management console.

The new DataStar features will be available this week. DataStar pricing starts at $36,000, while the Pentium option costs $9,925. MQView will be available in December for prices starting at $10,000. Agent software will cost extra.

©Apertus: (212) 279-8400.

BusinessBriefs

Sync Research, Inc. made a big splash last week when its initial public offering caused the company's stock to jump 120% in the first day.Initially expected to trade between $12 and $14, the 3.9 million shares that were offered were priced at $20 and, by the end of the day, had closed at $44 a share.

Sync, based in Irvine, Calif., makes networking equipment with a nod toward frame relay access devices.

MCI Communications Corp. has contracted Unisys Corp. to provide network integration and desktop services for MCI's data networking customers. Under the three-year, multimillion-dollar arrangement, Unisys will provide MCI with procurement, configuration, staging, installation and maintenance services on routers, modems and other devices at customer sites. The primary focus of the agreement is for service on equipment manufactured by Cisco Systems, Inc. and Bay Networks, Inc.

Meanwhile, **MCI** last week said it has completed its acquisition of information technology outsourcing company **SHL Systemhouse, Inc.** The Ottawa-based SHL has absorbed MCI's Professional Services data network management outsourcing group and will continue to operate as a stand-alone MCI company.

Routers

Continued from page 17

while, is a self-contained LAN/WAN router for Web and branch office file servers. It supports Windows NT and NetWare operating systems, and requires no routing software on the server.

Incarda sports one Ethernet and one WAN attachment, and supports IP and IPX routing at up to T-1/E-1 speeds. It interoperates with routers from Cisco Systems, Inc., Bay Networks, Inc. and 3Com Corp., according to Sourcecom.

The company claims that Incarda overcomes the performance limitations and expense of server-based routers that separate routing software from WAN processing. With these implementations — which are offered by the leading vendors at three times the price of Incarda — the server's CPU must process packet routing, which can degrade both routing and server performance.

Incarda avoids this by performing all processing onboard. "There are some issues with the software approach," said Charlie Robbins, vice president of data communications research at Aberdeen Group, Inc. in Boston.

"All the impacts on the server have to be considered," he said.

Incarda costs $695 for an ISA version, which is available now, and $895 for a PCI bus model.

©RND: (714) 436-9700; Sourcecom: (805) 294-0555.

[illegible] THAT [illegible] OR THE ONE THAT UNDERPRICES THEM.

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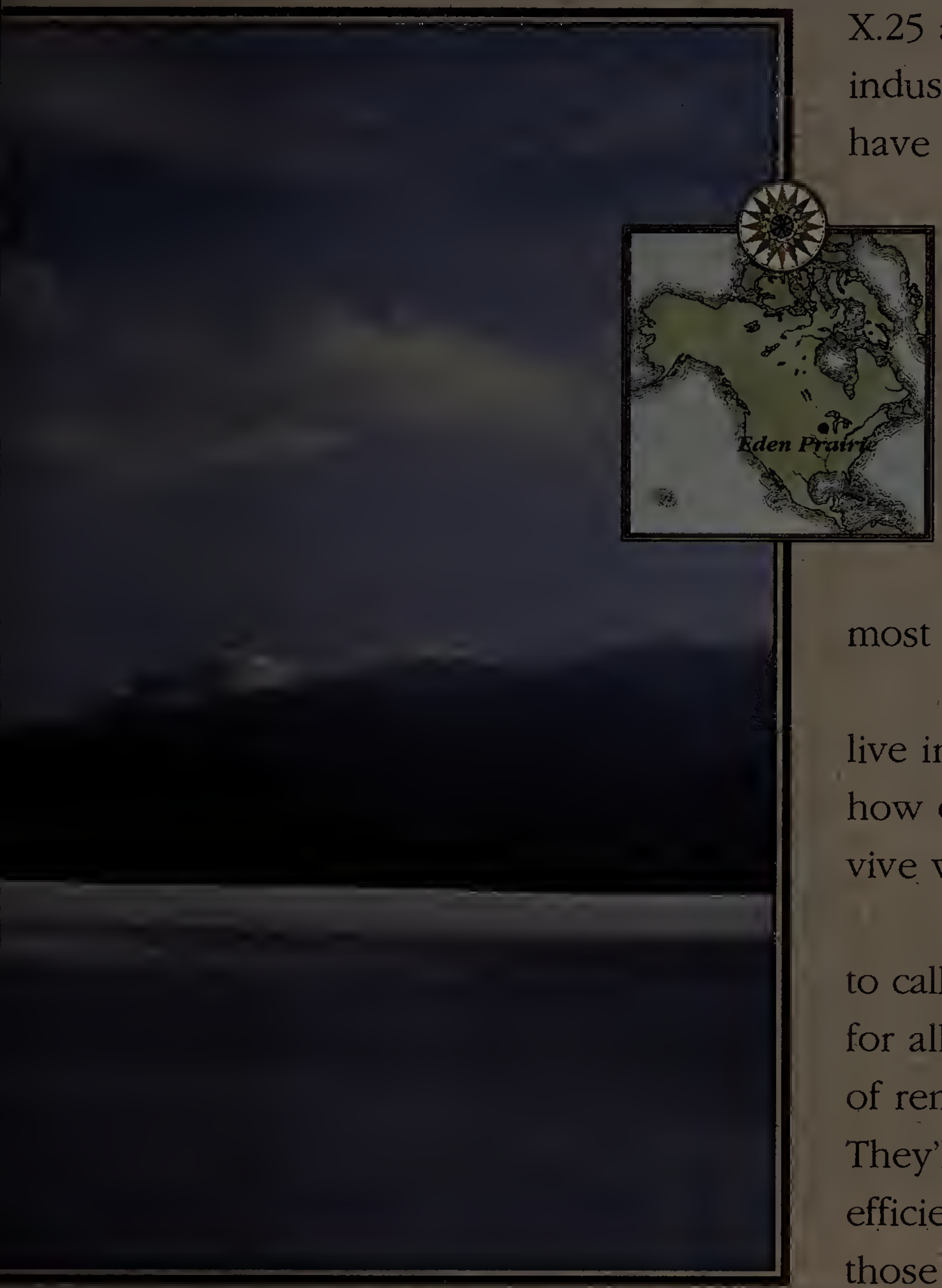

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IBM's new network vision a bit cloudy

By Michael Cooney
Las Vegas

IBM Chief Executive Officer Lou Gerstner may not always have a vision, but when he does, it's a doozy.

The IBM leader outlined his "network-centric" computing strategy for Comdex/Fall '95 attendees here last week. Gerstner described in somewhat vague terms how IBM intends to make distributed, collaborative workgroup computing over high-speed, high-bandwidth networks a market it will drive in the next few years.

"I'd say we're betting much of our future on it," Gerstner said. If that's the bet, then the Vegas oddsmakers could see a lot of action in the coming years because IBM's success in this arena is no sure thing, observers said.

Gerstner *plans to push IBM toward a more 'network-centric' computing strategy.*

"IBM has many of the products and tools to be a leader. But it has just missed the boat in so many areas, it's hard to imagine them coming up with anything particularly innovative, then following through with it," said Dixon Doll, chairman and CEO of the DMW Group consultancy in Menlo Park, Calif.

"To be successful in the network-centric world Gerstner envisions, IBM needs to scrap many of the ways it currently does business, and it's not clear it is doing that," Doll added.

IBM is trying to move rapidly in a number of areas to achieve Gerstner's lofty vision. "We're making an enormous investment in the Internet because we think it represents the most powerful manifestation of what network-centric computing can be," Gerstner said.

But just jumping on the Internet bandwagon will not be enough, analysts said.

"Gerstner is hoping the Internet and Notes cover a multitude of sins IBM has committed in the past. But that's not likely because there's no cohesive glue to what he's talking about," said Anura Guruge, an independent analyst based in New Ipswich, N.H. "I think he needs to define exactly how Notes is going to be exploited."

Gerstner also acknowledged that the road to network-centric computing would not be easy. He said the promise of distributed computing has not been fully delivered.

"Our industry promised customers that they could buy all these individual pieces and put them together very easily," he said. "But that hasn't happened because it's harder than a lot of people thought."

When users try to scale these piece-part solutions up to thousands and tens of thousands of users — as well as critical functions like heavy transaction processing and data mining — it gets very tough, Gerstner added.

"Client/server computing has been far more expensive than anyone imagined," he said. "It's expensive because a lot of customers — especially large organizations — are waking up to the fact that they have put the equivalent of a 1985 mainframe on the desks of every one of their clerical workers." ■

Internet-only workstation due next year

IBM CEO Lou Gerstner said the company will ship an Internet Workstation early next year. The diskless Internet Station will run an Internet browser, likely Netscape or IBM's own, and contain a network adapter card for connecting to an Internet service.

Analysts noted that other vendors are working on such Internet-only devices, which should cost no more than about $1,000 because they are not designed to replace or compete with regular PCs.

Analog

Continued from page 17

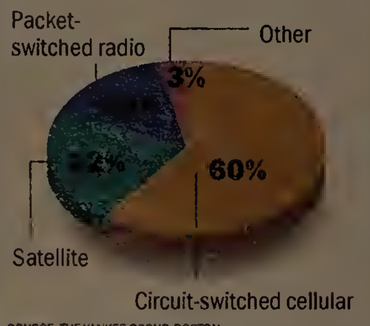
condition of a line and throttling traffic back when noise is detected, rather than disconnecting the call.

Southwestern Bell Mobile announced its service, slated to be commercially available in the carrier's Chicago market early next year, at the recent Wireless World '95 conference in San Francisco. The move came after a string of similar announcements, including one from BellSouth Cellular Corp. in September and another last month from AT&T Wireless (*NW*, Oct. 23, page 10).

THE MEDIUM IS THE MESSAGE

Despite lip service paid to CDPD, RAM and ARDIS, today's half-million mobile data users rely mainly on the good ol' analog cellular network.

Percentage of total wireless data traffic handled over...



SOURCE: THE YANKEE GROUP, BOSTON

Until recently, the carriers have not been promoting circuit-switched analog services for data. However, "people have been doing it on the sly," often without the error-correcting benefit, and have been getting frustrated, said Iain Gillot, manager of wireless communications research in the Austin, Texas, office of the IDC/LINK consulting firm.

The carriers have now acknowledged this and, in the absence of much CDPD, have concluded that they might as well make money off data however they can, he said.

They have realized that "CDPD is stuck in the vertical market trenches, next to [its nemeses] RAM and ARDIS," which have competing nationwide packet services, said Bill Frezza, president of Wireless Computing Associates, Inc., a consulting firm in Yardley, Pa.

Southwestern Bell Mobile, a founder of the CDPD Forum, does not have any CDPD services deployed yet.

Its fledgling modem pool service works with software codeveloped by IBM that helps end users manage the toggling between cellular and land-line connections, said Doug Berg, director of data services at Southwestern Bell Mobile.

Users can click on a cellular or land-line icon on their laptop's Windows screen, and the software will automatically engage the proper modem command string for the desired transmission medium, rather than requiring the user to type it in.

The Southwestern Bell Mobile-IBM software will eventually let users click on an icon to access the Internet or other on-line service. Other icons let users download weather, news or additional information. Encryption options will also be available.

A fax icon will allow users to send a fax from their laptops. To make fax transmissions more reliable, the Southwestern Bell Mobile network will convert the fax to data on the cellular leg of the trip and back to image again for forwarding over land lines to its destination, Berg said. ■

WAN MONITOR

ISDN PRI: found money

Have you ever reached into a pocket after doing the laundry and found a washed $20 bill that you didn't know you had? It's sort of like winning the lottery. (Well, at least a little one.)

ISDN Primary Rate Interface customers face a similar situation, discovering added value squirreled away in their network.

Daniel Briere and Christine Heckart

Most large net users already have PRI, but now that Basic Rate Interface is being embraced by the market, the value of installed PRI to support different applications has grown.

Most PRIs were installed to support a single application, such as videoconferencing or call centers. Some of the other functionalities inherent to PRI, like call-by-call setup, are seen as niceties but not driving forces behind the installation of a PRI circuit.

Now there is growing value in other applications supported by ISDN that can be handled by PRI. That's the money "found" in your net pocket.

The driver for all of this is actually the acceptance of BRI, which has finally found its killer application in Internet connectivity, and the inclusion of ISDN functionality as a standard feature on much customer premises equipment (CPE). This has created an "audience" of ISDN users to which ISDN applications can be marketed. These applications would be supported at the enterprise level by a PRI. Now that ISDN is widely available and ISDN functionality is integrated into most of today's CPE, what can you do with a PRI beyond automatic number identification delivery? Here are some ideas:

■ **Extend to remote sites.** ISDN access to frame relay is helping smaller sites become integrated into the corporate data network — much the same way virtual network switched access extended corporate voice networks to these sites in the late 1980s. MCI Communications Corp. and Sprint Corp. both offer ISDN access to frame relay, and AT&T will in the near future.

■ **Reach out to your customers.** ISDN can help you take your application closer to your customers, making it easier to conduct business.

For example, one financial services company is reaching out to its customers by creating a collaborative computing environment. Here, customers and their brokers can work together on the customers' portfolios, both on the same software file, using ISDN as the dial-in method. The installed PRI at the headquarter locations supports the BRI line into the remote site to enable the application.

■ **Use Digital 800 to extend PRI's effective reach.** PRI access once meant a site was isolated from users on other carriers' networks. There was no way to switch calls to another carrier's network — diminishing the value of using ISDN through PRI on an intercorporate basis for video, collaborative computing, etc. With Digital 800 and BRI service, users of any carrier's service can call your site because the call is switched at the local level. AT&T and MCI offer this service today, and Sprint will soon.

If budgets are tight, check the washing machine first. Then check into the money you may have stuck into your ISDN lines and forgotten about.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at danny_briere@telechoice.com or christine_heckart@telechoice.com. They share this space with Scott Bradner, whose column will appear next week.

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IS heads outside for monitoring

By Joanie Wexler

It is no secret that the widely heralded era of selective outsourcing has descended upon corporate networking departments. But which tasks are actually getting farmed out to third parties, and why?

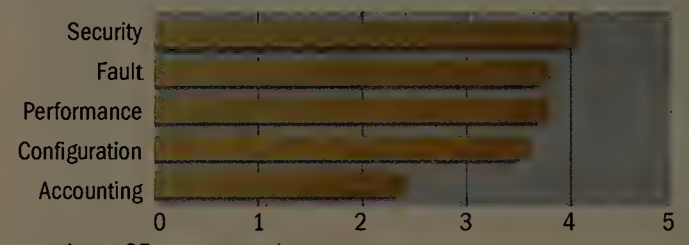
The most prominent up-and-comer, according to analysts, is remote network monitoring. In an outsourcing scenario for this task, a provider attaches directly to the customer's net with its own tools and human resources. The provider can then grab information about traffic patterns and loads, network usage, performance and faults, as well as other conditions, and turn it into useful reports.

HOT BUTTONS

Figure 1

The Internet is making chinks in corporate networks, so security management has become a top concern.

Users' importance rating of management functions (5 being the most important).



User survey base: 95 user companies

GRAPHIC BY TERRI MITCHELL

SOURCE: DATAQUEST WORLDWIDE SERVICES, WESTBOROUGH, MASS.

This is the information on which users — either by themselves or with their outsourcing vendor — base network management decisions, such as how to reconfigure the network to squeeze more efficiency out of it.

Although revenue estimates and projections of this market are all over the map, they all come to the same conclusion: Using remote monitoring services is becoming the in thing.

According to Dataquest Worldwide Services Group in Westborough, Mass., the still-embryonic, $60 million remote network monitoring market will hit $750 million in 1999.

On the other hand, International Data Corp. (IDC) in Framingham, Mass., places the 1994 remote monitoring market at $92 million and expects it to hit nearly $4 billion in 1999.

The reasons for the big jumps? Growing net complexity, the gelling of standard monitoring tools, the extension of corporate America's business hours and newfound vendor partnerships, analysts and users said.

Outsourcing has become popular because net managers simply have so much to handle. Their multivendor corporate nets are sprawling, and for many, the associated quantities of tools and expertise required to handle network monitoring and management in-house have spiraled out of control. Monitoring is an attractive function to farm out because it is routine rather than strategic, easing the decision to trust it to an outsider.

In addition, the implementation of standard network management technologies such as the Simple Network Management Protocol and Remote Monitoring (see story, this page), are playing a big role. Their implementation is giving users faith in third parties' ability to monitor their networks at least as well as they would do it themselves, said Traci Bair, program manager of network support and integration services at IDC.

Monitoring services are also picking up because businesses with around-the-clock operations need help after 5 p.m., said Val Sribar, service director at Stamford, Conn.-based META Group, Inc. With networks now often grinding away seven days a week, 24 hours a day, in-house resources are drying up, and companies must supplement their in-house staffs, he said.

By one estimate, it takes 13 to 15 network operators to perform monitoring of a 24-hour, midsize multinational network. But it doesn't work that way. Brenda Vathauer, marketing manager for the operations services division at Hewlett-Packard Co., said, "We could take those same 13 to 15 operators and manage up to 50 customers' networks," allowing users to reap the cost benefits of HP's economies of scale.

She estimated a 10% to 25% cost benefit for users that tap into the tools and human resources infrastructure of an outside provider.

At the top of users' monitoring priority lists are security services (see Figure 1). The reason is simple: Companies are opening up their businesses to the unbridled Internet and other interenterprise links, which can create chinks in security, said Jeff Kaplan, director of Dataquest Worldwide Services Group.

However, users will be frustrated on that score for a while, as few vendors offer security monitoring today. But there is hope; ACSYS, Inc., a remote LAN support and monitoring company in Burlington, Mass., for one, plans to launch such a service in January, said Mark Williams, product manager for the company.

Meanwhile, vendor partnering is making third-party services more attractive, according to Kaplan. For example, Bell Atlantic Networks Integration has hooked into Bay Networks, Inc.'s help desk. And HP has relationships with all the top names in internetworking and WAN gear. HP has access to their databases and software patches, and officially teams with the vendors to solve a common customer problem, Vathauer said.

Despite all these touted benefits of outsourcing, some companies are not in it for the long haul.

The Clorox Co. in Oakland, Calif., for example, is using International Network Services, Inc.'s NeTracker automated remote monitoring service for its LAN internetwork environment — temporarily. The service is helping Clorox lay the foundation for the new network, but the company hopes to eventually bring all monitoring in-house.

"The bottom line is we have to be responsive to our customers. It's not all about saving money," said Rick Girard, Clorox's manager of metropolitan and local-area networks.

He explained that when building the network, the company had no monitoring tools in-house. "Before we could justify the cost of an enterprise platform, we needed to track traffic as applications came onto the network and determine where performance was impeded," Girard said.

But in the long run, Clorox perceives that in-house personnel will be able to respond more quickly to network issues and users.

For users that do turn to third parties for the long haul, "the real trick is figuring out the metrics for making sure vendors are doing a good job," META Group's Sribar said.

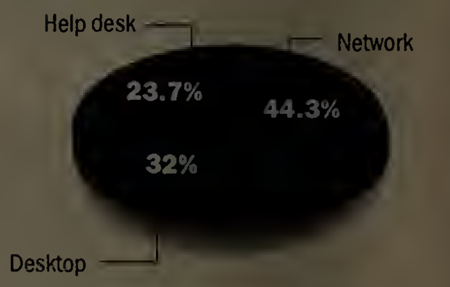
He suggested that users craft a well-defined network service-level agreement with their vendors and review it each week to make sure it was met. ■

WHERE HELP IS NEEDED

Figure 2

Network support is taking a big bite out of an IS staff's day, causing some to off-load routine tasks, such as performance monitoring.

Percentage of time spent on support activities:



Survey base: 91 user companies

SOURCE: DATAQUEST WORLDWIDE SERVICES GROUP, WESTBOROUGH, MASS.

RMON holds service promise

Innovative developments with Remote Monitoring (RMON) technology will be a boon to outsourced monitoring services once a few problems get solved.

RMON is the network management standard for collecting information about network performance, traffic loads and patterns, faults and other conditions. Equipment called RMON probes monitor individual LAN segments, while emerging RMON2 gear tracks events across an end-to-end multivendor network.

While minimally deployed in third-party monitoring services today, RMON is expected to play a large role in the future. But there are management, disaster recovery and security hurdles to overcome first.

Network congestion is one. Shipping volumes of monitoring data across a customer's net to the third party's network operations center can clog the user's network, pointed out John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

A second problem is if there is a fault in the user's network or in the link between the service provider's site and the user's network, the service provider's ability to continue functioning is shot, McConnell said.

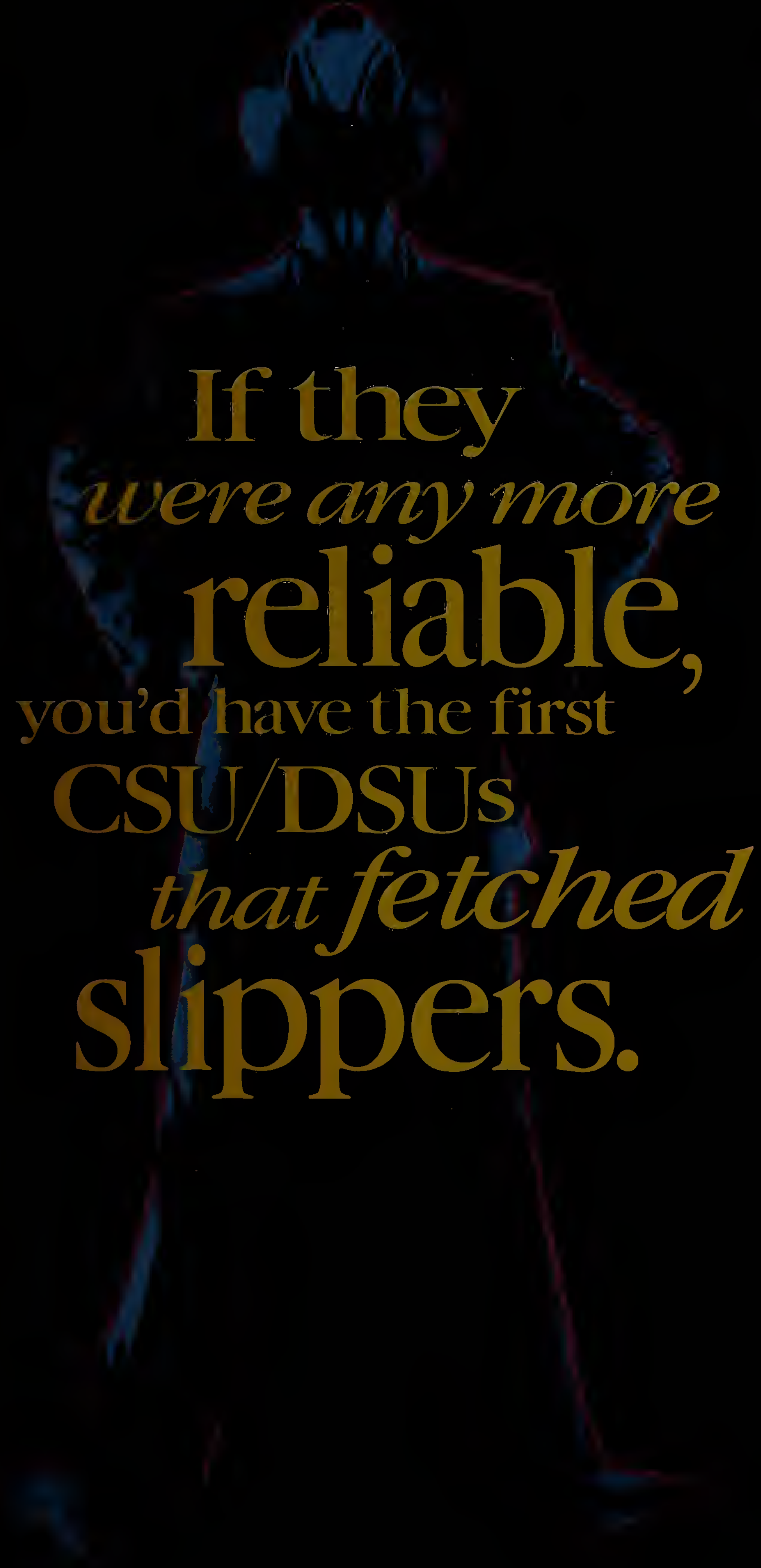
Dial-up links on RMON probes, however, will soon come to the rescue. Vendors such as Axon Networks, Inc., Frontier Software Development, Inc. and Network Application Technology, Inc. (NAT) are reportedly planning to enhance their products with ISDN and analog dial-up links.

Such connections would allow a third party to link directly into a given probe. This would allow collected data to be fired off directly to the service provider's premises, rather than traversing the user's network and potentially clogging it. Second, if the service provider's primary link to its customer failed, the dial-up connections could be used as a redundant path.

Another red flag for users is that they must be able to retain some control over network security. RMON probes could be used to pick up user passwords, McConnell pointed out.

To ease users' minds, Axon, Frontier, Hewlett-Packard Co., NAT, Network General Corp., Novell, Inc. and others are said to be incorporating multilevel access schemes in their products. Some should start shipping early next year.

By Joanie Wexler



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Local Networks

Covering: Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Briefs

■ **FaxPress NLM,** *a 32-bit NetWare Loadable Module (NLM) designed to give end users the ability to send and receive faxes over Novell, Inc.'s NetWare 3.X and 4.X LANs, was released last week at Comdex/Fall '95 by* **Castelle, Inc.** *of Santa Clara, Calif. The NLM supports ISDN boards, fax modems and intelligent fax boards for networks of all sizes. It supports binary file transfer and automatic detection of graphics files. FaxPress costs $595 for a five-user version.*

Castelle: (510) 538-8916.

■ *Network interface card vendor* **NDC Communications, Inc.** *in San Jose, Calif., last week made its foray into the* **wireless LAN** *market when it announced a partnership with* **Symbionics Networks, Ltd.** *of Cambridge, England. NDC will incorporate Symbionics' 2.4-GHz spread-spectrum radio technology into its new wireless LAN adapter products. The adapters will be available in second-quarter 1996.*

NDC: (408) 428-9108.

■ **CNet Technology, inc.** *in San Jose, Calif., last week rolled out an eight-port* **Ethernet switching hub** *designed to help users relieve LAN congestion. The stand-alone device, dubbed PowerSwitch, offers a forwarding rate of 14,800 packet/sec and supports 4,096 media access control addresses per port. PowerSwitch is available now and is priced at $2,995.*

CNet: (408) 954-8000.

■ **Tally Systems Corp.** *of Hanover, N.H., has expanded the reach of its* **asset management** *software package to support computers running Windows 95 and Windows NT, as well as to work with Microsoft Corp.'s Systems Management Server.*

Tally's new Centergy package includes NetCensus 2.8, CentaMeter 2.5 and WinInstall 5.1. The product is currently shipping and is priced at $33.95 per PC for 100 PCs and $25.50 per PC for 1,000 PCs.

Tally: (800) 262-3877.

High-speed LANs

Token-ring switches help utility power up

By Jodi Cohen
Reading, Pa.

When General Public Utilities Service Corp. (GPU) was evaluating token-ring switches last year to boost network performance, there was only one device on the market.

Javier Rodriguez, a GPU senior staff member in information services, knew at the time he was ahead of most other network professionals in exploring token-ring switching. And now that he has deployed 12 Standard Microsystems Corp.'s (SMC) EliteSwitch ES/1 backbone switches across GPU's network, he also has a better understanding of the benefits than most of his peers.

MORE ON-LINE

See what's in the token-ring pipeline. Link to http://www.nwfusion.com. From the main menu, select News+ then Local Networks.

Unlike an Ethernet environment where network congestion occurs on individual LAN segments, the major source of token-ring bottlenecks is the backbone.

Most token-ring networks — such as GPU's — consist of multiple rings linked to 16M bit/sec backbone rings via two-port source route bridges.

However, Rodriguez said a token-ring switch can be used to replace these bridges, increasing net throughput and reducing latency.

Individual rings on a network can be connected to a port on the switch at 16M bit/sec, providing the same source route functions as the bridge.

The electric utility has about 200 token rings running NETBIOS, source-routed SNA, IP and VINES. The network consists of eight hub centers — major concentration points in the net — which previously com-

See **Switches,** *page 28*

College keeps campus cool with Warp Server

By Peggy Watt
Kalamazoo, Mich.

Beneath the Georgian brick buildings, large oak trees and cobblestone paths of Kalamazoo College is a growing fiber-optic Web linking the IBM OS/2 Warp systems that help keep campus facilities cool in summer and warm in winter.

And now to ensure that the college's halls remain comfortable places to roam, the institution is putting a beta version of OS/2 Warp Server to the test as a core component of its PC LAN-based energy management system.

It just makes sense

OS/2 Warp Server was a logical choice since it already supports the environmental monitoring software used by the college, said Forrest Duddles, environmental technician and science facilities specialist at the 162-year-old institution.

In addition, it works well with OS/2 Warp, which the college is already using in combination with Warp Connect communications software to link environmental monitors within and across several buildings.

Also, OS/2 Warp Server features basic backup and recovery functions, remote access capabilities and more. The successor to IBM LAN Server has been in beta test since August and is expected to ship by year-end.

"OS/2 Warp Server comes bundled with a lot," said Bob Sakakeeny, an analyst with Aberdeen Group, Inc. in Boston. "When you buy [Novell, Inc.] NetWare, you have to buy all those components separately."

OS/2 WARP SERVER FEATURES

- Basic backup and recovery functions
- Remote access capabilities
- Selective installation of file and print services
- Automatic detection of peripherals upon installation
- System management
- Internet-ready
- Support for Macintosh, Windows 3.X, Windows 95, DOS and OS/2 clients

Actually, the beta of OS/2 Warp Server has had difficulty identifying some of the potpourri of network interface cards at Kalamazoo College, Duddles said.

But he called the installation "a snap" — especially compared to deploying LAN Server — and says the built-in backup functions in particular are sophisticated enough that he will not need more backup software.

The college's environmental management systems consist of a mix of outdated minicomputers and micros installed piecemeal during the past 20 years as energy costs became more of a concern, Duddles said.

"Each time we renovated a building, we put in a different kind of hardware," he said. His job now is devising a means of integrating the energy management systems within the vintage buildings without replacing all the hardware at once.

The basic strategy is to migrate all the systems to 486DX computers running different iterations of OS/2 as well as Paragon, an energy management package from INTEC Controls, Inc. in Walpole, Mass.

So far, five of about three dozen campus buildings run Paragon as well as OS/2 Warp and Warp Connect over TCP/IP-based peer-to-peer network. Warp Server will run on a server supporting networkwide mainte-

See **Warp Server,** *page 26*

LAN BACKUP AND STORAGE BOX

Company:	McAfee	Arcada
Product:	ServerStor 2.0	Arcada Backup for OS/2 Warp
Features:	Server backup, disaster recovery, hierarchical storage management, stand-in server support mechanism	32-bit architecture and technology that guides user through file or hard-disk restoration
Availability:	Stand-alone version will be on McAfee's Web site in December; the software will be part of McAfee's Saber LANWorkstation in Q1 1996.	January 1996
Cost:	$7.50 per node for 1,000 nodes	$149 for the Professional edition

Backup products debut at show

McAfee and Arcada lead pack of vendors with offerings.

By Ben Heskett
Las Vegas

A handful of vendors introduced their latest network storage and backup offerings last week under the bright lights at Comdex/Fall '95 here.

McAfee, Arcada Software, Inc., Cheyenne Software, Inc. and Conner Storage Systems all rolled out products designed to keep pace with Windows 95 and other developments in the operating system market.

McAfee debuted Version 2.0 of its ServerStor server management software, which runs on NetWare 3.X and 4.X servers. The new product offers a variety of features designed to protect network data, including hierarchical storage management capabilities and a server mirroring mechanism. A Windows NT product is expected in the coming months.

The new version is being sold as a stand-alone product as well as within Version 1.5 of the Saber Software suite. McAfee acquired Saber Software in August.

Meanwhile, Arcada unveiled its strategy to provide backup products for users of IBM's operating system software.

The first such offering, called Arcada Backup for OS/2 Warp, will be introduced in two editions that back up both the client and the server: a personal version supporting floppy disks and a professional version supporting SCSI-controlled tapes.

See **Backup products,** *page 28*

Agile supports IP multicasting in ATM software release

By Jodi Cohen

Boxborough, Mass.

As expected, Agile Networks, Inc. last week rolled out a software upgrade to its Asynchronous Transfer Mode switch that will let users support IP multicast traffic over virtual LANs (*NW*, Oct. 9, page 29).

IP multicasting allows a device to send one packet to multiple net destinations simultaneously. It supports applications such as videoconferencing, stock market and news feeds, and Multicast Backbone (Mbone) for video over the Internet.

The problem with deploying IP multicast applications in switched nets is that it is difficult to map users in a logical network, according to Ram Das Rao, manager of network systems for the information technology network systems group at Boston University. "The multicast sessions have a dynamic setup and teardown process. So with people all over [a switched] network joining and leaving sessions as they wish, it can be hard to keep track of everything," he said.

To address the problem, Agile has integrated IP multicast technology with the VLAN software running on its ATMizer switches, letting users automatically form VLANs for each IP address detected on a net. This way, users are automatically assigned to a VLAN whenever they start an application. Without this capability, IP multicast traffic would be broadcast to every IP address, which could significantly reduce network performance.

According to analysts, the key to Agile's approach — the first automatic IP multicast VLAN feature on the market — is it ensures that IP multicast frames are only delivered onto LAN segments with registered IP multicast users. That will make it easier to manage VLANs and eliminate performance bottlenecks.

IP MULTICAST

The transmission, from one source, of a single IP packet to multiple destinations simultaneously. Uses IP Class D addresses to identify a group of endstations independent of host IP addresses, IP subnet addresses or LAN segments.

Agile's ATMizer LAN switches examine Layer 3 net data to form VLANs that interconnect endstations with the same protocol support and subnetwork address.

Rao said he is looking forward to the updated VLAN software. "The usage for IP multicasting has been growing, especially for applications like Mbone on the Internet. And that's of great interest to researchers in our net environment who do [audio conferencing] and videoconferencing," he said.

The IP multiicast feature is available now at no charge to Agile customers.

©Agile: (508) 263-3600.

Warp Server

Continued from page 25

nance and controlling system backups, among other things.

Kalamazoo College started installing fiber-optic cable several years ago as an antidote to electronic systems burnout during frequent Midwest storms. Previously, computer systems were connected by twisted-pair wire, but that proved a poor choice for systems housed in older buildings that are not well grounded.

"The storms can fry electrical equipment," Duddles said. "In a good lightning storm, we'd blow out interface boards in machines all over campus." His department coordinated with the IS department that handles business and student systems, and strung cable through existing steam tunnels, as well as through conduits installed as part of a new water distribution system.

He has not persuaded the typically Macintosh-oriented students and faculty to try OS/2 but said they can at least share the fiber cable and other plumbing. ■

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Switches

Continued from page 25

municated via T-1 links.

Besides replacing local bridges with the switches, GPU is using the switches' High Speed Serial Interface links to connect the hub centers across the WAN at T-3 speed.

Rodriguez said the T-1 links did not provide the response time GPU required.

"The 45M bit/sec links give us the high-bandwidth capability we need for our imaging and remote backup applications. Anytime we fall back to the T-1 links, we get user phone calls indicating that performance has dropped," he said.

Because Rodriguez has enjoyed such performance gains with switching, he said that some servers may no longer be necessary.

"Some applications used to be split across multiple servers at multiple sites," he said. "But with the token-ring switches, the speed is now fast enough that we are looking to consolidate some of those servers."

The switches also feature Simple Network Management Protocol support that has enabled GPU to better manage its token rings, Rodriguez said. For example, GPU is using an SNMP console to gather statistics on token-ring usage.

GPU is complementing the SMC management tools with several Axon Networks, Inc. Remote Monitoring (RMON) switch probes, he said. Rodriguez would like to see SMC add built-in RMON capabilities down the road.

Rodriguez said that he has yet to see a reason for GPU to implement virtual LANs, a well-known feature of most LAN switches. He explained that all of GPU's servers are concentrated on rings separate from those supporting clients.

"VLANs are intended to allow net managers to dynamically change groups of users to stay within a segment depending on which servers they need to access. We don't do that," he said.■

Switch wishes

GPU's Rodriguez hopes to see the following features in SMC's next version of the ES/1 token-ring switch:

- ▶ Internal RMON support
- ▶ SNMP support for source route frames
- ▶ Ability to reset statistics counters to zero
- ▶ Support for fiber links
- ▶ Token-ring modules with higher port density (six or eight ports)
- ▶ ATM interface cards
- ▶ Port-mirroring

Backup products

Continued from page 25

Moving into the IBM space, Arcada is planning to offer OS/2 users products for the desktop — addressed with this initial product — as well as products for multiple LANs running across an enterprise net, according to Dori Abele, Arcada's product marketing manager for the OS/2 business unit.

The January 1996 release of the Arcada offerings will coincide with the introduction of IBM's next version of OS/2 Warp, Abele said.

The OS/2 market would remain strong despite the proliferation of Windows NT, she predicted, adding that Windows NT's growth is cutting into NetWare and Unix sales more than OS/2 sales.

Arcada currently provides storage and backup products for servers running NetWare or Windows NT, as well as for a variety of desktop operating systems.

Separately, Cheyenne used the Comdex show to demonstrate its ARCsolo backup product and InocuLAN antivirus product for Windows 95. Both are designed for stand-alone workstations.

The products will ship at the end of this month. ARCsolo is priced at $149, and InocuLAN costs $69.

Elsewhere at Comdex, Conner Storage Systems, a division of Conner Peripherals, Inc., announced a new high-end RAID subsystem.

The nStor CR8 supports RAID Levels 0, 1 and 5, and provides 200G bytes of RAID 5 capacity. The product is available now starting at $9,250.

©McAfee: (408) 988-3832; Arcada: (800) 327-2232; Cheyenne: (800) 243-9462; Conner: (407) 263-3500.

BusinessBriefs

Utopia Technology Partners, Inc. last week said it has acquired the In Control asset management product line from Portsmouth, England-based **Deverill Software Publishing, Ltd.**

Utopia plans to unite capabilities of In Control with its Utopia/Help Desk inventory tracking and reporting product.

The next version of Utopia's software is scheduled for release in the second quarter of next year, and it will include the asset management functions.

Newbridge Networks, Inc., based in Herndon, Va., recently named **David Leslie** as vice president of North American sales for the company's **VIVID business unit,** which develops Asynchronous Transfer Mode LAN products.

Leslie's key responsibility will be to build a sales organization to meet the growing demand of the VIVID product line.

Previously, he held several key management and sales positions at UB Networks, Inc.

General Signal Corp. in Mount Laurel, N.J., last week announced the completion of its merger with **Data Switch Corp.** As a result of the merger, General Signal will form a new business unit dubbed General Signal Networks, which will provide LAN switches and other LAN connectivity products.

High-performance I/O subsystems and storage peripherals provider **Adaptec, Inc.** in Milpitas, Calif., last week announced that it acquired **Power I/O Corp.** of Irvine, Calif., in a $7 million cash transaction.

Power I/O is a privately held company that develops high-speed I/O and networking technologies.

Alantec Corp. of San Jose, Calif., last week announced the appointment of **Stephen McRae** to the position of managing director of Asia-Pacific operations.

In his new position, McRae will be responsible for the company's Pacific Rim technical support and distribution activities. Prior to joining Alantec, McRae was chief executive officer at frame relay vendor Netlink, Inc.

Gandalf Technologies, Inc., which is based in Nepean, Ontario, has announced partnerships with **Ingram Micro, Inc.** and **Tech Data Corp.** to expand channels offering its remote access and other networking products. Gandalf products will now be available to more than 50,000 value-added resellers and retail dealers in the U.S., according to the company.

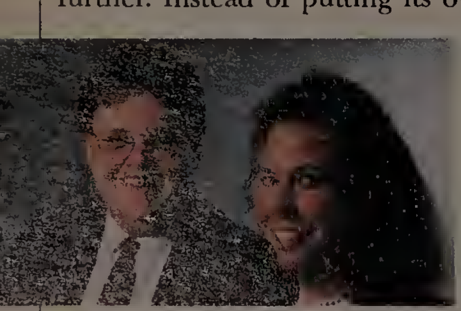
Gandalf also announced that **Corel Corp.,** Canada's largest software developer, has selected Gandalf Xpress to support its telecommuting requirements. Gandalf Xpress is a family of remote access and concentration products.

NET RESULTS

Virtual support in a brave new world

Over the last 24 months, reality in the networking market has been relative — it depends on which vendor strategy is in front of you.

Well, one network vendor has gone a step further. Instead of putting its own spin on reality, UB Networks, Inc. has created its own world. Yes, UB World was unveiled earlier this month as the first commercial three-dimensional "world" on the Internet.



Skip MacAskill and Melinda Le Baron

Now you're probably asking yourself, so, uh, what exactly is UB World? And what can it do for me? And who gave it that awful name?

You'll have to ask UB about the name, but the world itself is more than just a marketing tool for the hub and switch maker.

Beyond using the site for the typical product information and promotional activities, UB will initially provide a 24-hour-a-day, seven-day-a-week service and support help desk for all of its networking products.

And the company will add even more functionality in the future.

This is an interesting concept for a help desk and a great departure from either the telephone or the electronic mail access most vendors offer today. Traditional approaches minimize the physical steps necessary for communication between the user and the technical support rep.

A virtual world would entail navigation, nice scenery, background sounds, attractive graphics and, in general, a more complex yet pleasing environment.

Will this help UB support its products better or will the trappings impede the original goal — to get customers answers to their specific problems as soon as possible?

Here's how we think it will work...

Hey, Buddy, the first-floor Ethernet switch is hosed. Get UB on the phone. Oh, wait. Let's go to UB World. I haven't checked out the new software they sent us.

The user logs on to the site:

Wow! Cool background! And check out the sound. Hold on. What's that over there? It looks like a humongous hub. Let's check it out.

Twenty minutes later:

OK, now we really do have to find out about that Ethernet switch. Look, there's somebody with UB clothes on. Let's ask him. (A virtual UB employee floats into view.) *Hello. Can you help us? We need help with our Ethernet switch.*

You need to go to the one-story Services pavilion. Take a left, then a right, and then keep to the left side of the Interactive Initiatives pyramid of learning.

Thanks. I'll tell you what, let's check out the pyramid, then we'll ask about the switch.

Two hours after logging on, the Ethernet switch question is answered...

If we were network managers, would we want our technical staff browsing through exotic 3-D landscapes in search of a bug fix for a dysfunctional GeoRim switch?

Even though the answer is no, this new technology from UB does have some incredible possibilities in the world of electronic commerce, retail and what UB calls social computing.

UB World will be the first of many new worlds — we just hope that the others have better names.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.

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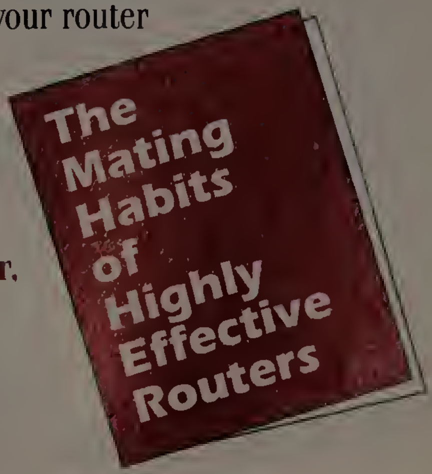

Cray
Communications

Circle Reader Service #32

When we go to work, we work on s
think about switching. When we ta
switching. When we eat dinner, we
about our future, we talk about swi
we go on and on about switching. Whe

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witching. When we eat breakfast, we
ke customers to lunch, we talk about
talk about switching. When we talk
tching. When we talk to our friends,
we go to bed, we dream about switching.

Should you come to us for switching?

Yes.

Should you come to us for a wild time on Friday night?

Probably not.

Going out on the town isn't exactly our strong suit. After all, we've spent every minute of every day for the last five years creating switches for every part of a network.

And our obsession has paid off. Our breakthrough ASIC technology has enabled us to develop products for virtually every switching need, whether backbone or workgroup; Ethernet or Token Ring; even FDDI, Fast Ethernet and ATM. The LinkSwitch™ 1000, with Fast Ethernet switching starting at $199* per port and the powerful LANplex® 2500, with throughput up to 565K packets per second (pps), are just two examples. And everything is covered by 3Com's® comprehensive Transcend® network management. The result? We're the worldwide market leader in backbone switching.

For help with all your switching needs, call **1-800-NET-3Com** and we'll send you the *Obsessed With Switching* kit which includes our *Pocket Guide to Switching*. For information on the hottest clubs in town, you're on your own.

3Com®

Circle Reader Service #31

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The one source for the many resources your network requires.

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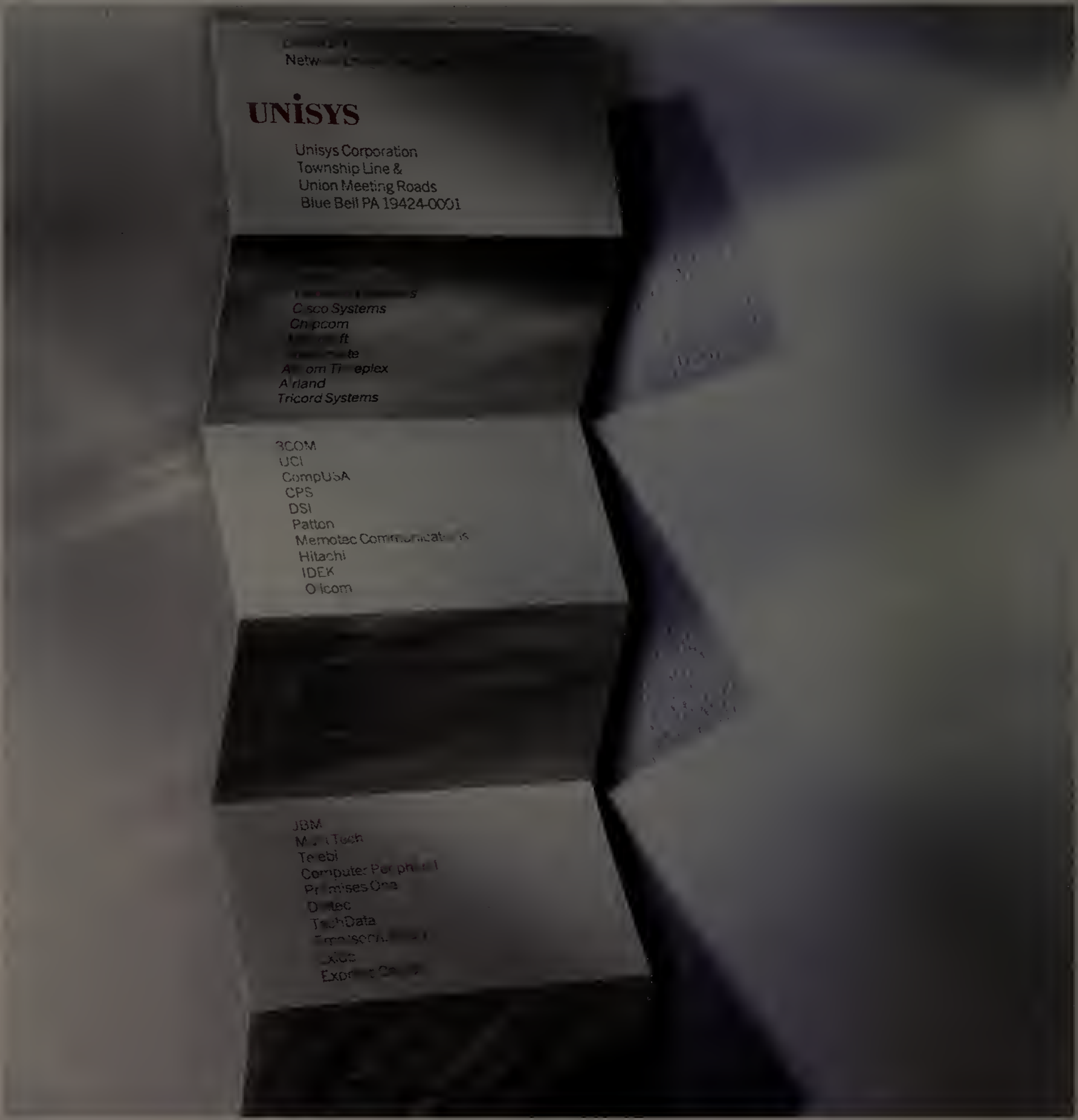
Unisys Network Enable is an easier, more efficient way to solve the problem.

With worldwide depth and expertise, we specialize in designing, installing and maintaining network solutions in multivendor environments.

This means that all you have to do is make one call and we can bring you the best possible solutions, no matter who happens to make them. And that includes over 9,000 products from over 130 vendors.

Besides providing you with the advantages of a single, fully accountable resource, there are many other reasons to call Network Enable.



For example, there's our impressive range of services. These include the creation and support of LANs, WANs and backbone networks. Preinstallation configuring and staging. And Unisys Desktop Services, our premier enterprisewide support program.

Now that you know Network Enable is the only name you need to know, there are two things you should do: Get rid of all those other business cards. And contact us today on the Internet at **http://www.unisys.com/adv** or by calling **1-800-874-8647, ext. 134.**

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THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

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If government, please specify division: ________________________________

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs, Distributors)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)*________________

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)*________________

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

A B
☐ 100 ☐ **LOCAL-AREA NETWORKS**
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ Network Op. Sys. Software
☐ 03. ☐ LAN Storage/Backup
☐ 04. ☐ Optical LAN Storage/Backup
☐ 05. ☐ Disk LAN Storage/Backup
☐ 06. ☐ Tape LAN Stnrage/Backup
☐ 07. ☐ RAID LAN Storage/Backup
☐ 08. ☐ Network Test/Diagnostic Tools
☐ 09. ☐ Cables, Connectors, Baluns
☐ 10. ☐ UPS
☐ 11. ☐ Network Interface Cards
☐ 12. ☐ Peer-to-Peer LANs
☐ 13. ☐ SNMP Network Management
☐ 14. ☐ ATM Switches
☐ 15. ☐ Token-Ring Switches
☐ 16. ☐ Ethernet Switches
☐ 17. ☐ Remote LAN Access/Communications Servers
☐ 18. ☐ Superservers
☐ 19. ☐ File/Application Servers
☐ 20. ☐ Print Servers

A B
☐ 101 ☐ **INTERNETWORKING**
☐ 21. ☐ Bridges
☐ 22. ☐ Routers
☐ 23. ☐ Bridge/Router
☐ 24. ☐ Gateways
☐ 25. ☐ Intelligent Hubs/Stackables

A B
☐ 102 ☐ **COMPUTERS/PERIPHERALS**
☐ 26. ☐ Laptops/Notebooks/Sub-Notebooks
☐ 27. ☐ Micros/PCs
☐ 28. ☐ Minis
☐ 29. ☐ Mainframes
☐ 30. ☐ Workstations
☐ 31. ☐ Terminals
☐ 32. ☐ Printers
☐ 33. ☐ Cluster Controllers
☐ 34. ☐ Monitors
☐ 35. ☐ Fax/Modem Boards

A B
☐ 103 ☐ **REMOTE/WIRELESS COMPUTING**
☐ 36. ☐ PDAs
☐ 37. ☐ PCMCIA Devices
☐ 38. ☐ Wireless Data Services
☐ 39. ☐ Wireless Data Equipment
☐ 40. ☐ Wireless LANs
☐ 41. ☐ Cellular Equipment & Services

A B
☐ 104 ☐ **INTERNET/ELECTRONIC COMMERCE**
☐ 42. ☐ Internet Access Providers
☐ 43. ☐ Firewalls
☐ 44. ☐ Web Servers/Browsers
☐ 45. ☐ Internet Software Tools

A B
☐ 105 ☐ **SOFTWARE/APPLICATIONS**
☐ 46. ☐ Network Management
☐ 47. ☐ Systems Management
☐ 48. ☐ Security
☐ 49. ☐ Communications Software
☐ 50. ☐ Terminal Emulation
☐ 51. ☐ Word Processing
☐ 52. ☐ Operating Systems
☐ 53. ☐ Client/Server Applications Development
☐ 54. ☐ Database Management/RDBMS
☐ 55. ☐ Spreadsheet
☐ 56. ☐ Groupware
☐ 57. ☐ EDI
☐ 58. ☐ E-mail
☐ 59. ☐ Windows/Graphical User Interface
☐ 60. ☐ Multimedia
☐ 61. ☐ Graphics/DTP
☐ 62. ☐ Remote Access
☐ 63. ☐ Imaging
☐ 64. ☐ Suites
☐ 65. ☐ Middleware
☐ 66. ☐ Document Management
☐ 67. ☐ Database Server
☐ 68. ☐ Site Metering Tools
☐ 69. ☐ Computer-Integrated Telephony (CIT)

A B
☐ 106 ☐ **WIDE-AREA NETWORK EQUIPMENT & SERVICES**
☐ 70. ☐ Frame Relay Equip./Services
☐ 71. ☐ Modems
☐ 72. ☐ FT-1/T-1/T-3 Multiplexers
☐ 73. ☐ FT-1/T-1/T-3 Services
☐ 74. ☐ SONET
☐ 75. ☐ Inverse Multiplexers
☐ 76. ☐ SMDS
☐ 77. ☐ Asynchronous Transfer Mode
☐ 78. ☐ Diagnostic/Test Equipment
☐ 79. ☐ DSU/CSU
☐ 80. ☐ VSAT/Satellite
☐ 81. ☐ ISDN Equipment & Services
☐ 82. ☐ PBXs
☐ 83. ☐ Voice Mail/Response
☐ 84. ☐ Videoconferencing
☐ 85. ☐ Leased Lines
☐ 86. ☐ Switched Data
☐ 87. ☐ E-mail/On-line Services
☐ 88. ☐ 800/900/MTS Services
☐ 89. ☐ Virtual Networks
☐ 90. ☐ Outsourcing/Systems Integration Services
☐ 91. ☐ Education/Training Services

☐ 92. ☐ None of the above (1-91)

6 What is the total number of LANs, workstations/nodes at this location/in your organization?

At this location:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

Entire organization:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

A B
☐ 55 ☐ **NETWORK ARCHITECTURES**
☐ 01. ☐ SNA
☐ 02. ☐ DECnet
☐ 03. ☐ TCP/IP
☐ 04. ☐ Novell IPX/SPX
☐ 05. ☐ APPC/APPN/LU 6.2
☐ 06. ☐ NETBIOS
☐ 07. ☐ AppleTalk
☐ 08. ☐ NFS
☐ 09. ☐ Other *(please specify)*________________

A B
☐ 56 ☐ **NETWORK OPERATING SYSTEM**
☐ 10. ☐ Microsoft (LAN Manager)
☐ 11. ☐ Novell (NetWare 2.X, 3.X)
☐ 12. ☐ Novell (NetWare 4.X)
☐ 13. ☐ Windows NT
☐ 14. ☐ Windows NT/Advanced Server
☐ 15. ☐ LocalTalk (AppleTalk)
☐ 16. ☐ Banyan (VINES)
☐ 17. ☐ IBM (LAN Server)
☐ 18. ☐ IBM (PC LAN Program)
☐ 19. ☐ Artisoft (LANtastic)
☐ 20. ☐ Digital (Pathworks)
☐ 21. ☐ Other *(please specify)*________________

A B
☐ 57 ☐ **LAN ENVIRONMENT**
☐ 22. ☐ 4M Token Ring
☐ 23. ☐ 16M Token Ring
☐ 24. ☐ Ethernet
☐ 25. ☐ 100M Ethernet
☐ 26. ☐ StarLAN
☐ 27. ☐ FDD1
☐ 28. ☐ LocalTalk
☐ 29. ☐ 10Base-T
☐ 30. ☐ ATM
☐ 31. ☐ Other *(please specify)*________________

A B
☐ 58 ☐ **COMPUTER OPERATING SYSTEM**
☐ 32. ☐ DOS
☐ 33. ☐ Unix/Xenix/AIX
☐ 34. ☐ OS/2
☐ 35. ☐ OS/2 Warp
☐ 36. ☐ IBM MVS
☐ 37. ☐ IBM VM
☐ 38. ☐ Digital VMS
☐ 39. ☐ Macintosh
☐ 40. ☐ Windows
☐ 41. ☐ Windows 95
☐ 42. ☐ X Window System
☐ 43. ☐ Solaris
☐ 44. ☐ Other *(please specify)*________________

☐ 45. ☐ None of the above (1-44)

8 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Do you have or plan to install client/server networks? ☐ Yes ☐ No

10 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

Mainframes		A – Installed	B – Planned
1.	IBM	☐	☐
2.	Amdahl	☐	☐
3.	Cray	☐	☐
4.	Hitachi	☐	☐
5.	Unisys	☐	☐

Minis		C – Installed	D – Planned
1.	IBM	☐	☐
2.	Digital	☐	☐
3.	Tandem	☐	☐
4.	Unisys	☐	☐
5.	AT&T GIS	☐	☐
6.	HP	☐	☐
7.	Data General	☐	☐

Which of the following do you have installed/planned: (USE NUMBERS ONLY)

	At this location:		Entire organization:	
	E – Servers	F – Clients/Nodes	G – Servers	H – Clients/Nodes
1. Power PC				
2. Power Macintosh				
3. Macintosh (Other)				
4. Pentium-based				
5. 80486-based				
6. 80386-based				
7. 80286-based				
8. RISC-based workstations				
9. Other				

11 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

01. ☐ $100 million or more
02. ☐ $50 million - $99.9 million
03. ☐ $25 million - $49.9 million
04. ☐ $20 million - $24.9 million
05. ☐ $10 million - $19.9 million
06. ☐ $5 million - $9.9 million
07. ☐ $1 million - $4.9 million
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $249,999 or less
11. ☐ None of the above

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ $10 billion or more
2. ☐ $1 billion to $9.9 billion
3. ☐ $500 million to $999.9 million
4. ☐ $100 million to $499.9 million
5. ☐ $50 million to $99.9 million
6. ☐ $10 million to $49.9 million
7. ☐ $5 million to $9.9 million
8. ☐ $4.9 million or less
9. ☐ None of the above

13 Estimated number of employees at this location/in entire organization:

At this location:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

Entire organization:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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Client/Server Applications

Covering: Databases • Messaging • Groupware
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Briefs

■ **The Computer Clearing House, Inc.** *of Rochester, N.Y., has announced that its FileCabinet 2.0 for Lotus Notes* **image-enabling** *software has three new features. Attach allows end users to replicate images in Notes databases. ImageAdd permits users to annotate and draw additional information onto a markup of an image. LocalViewer is a low-cost, multifaceted image viewer.*

The list price for Attach is $2,500. ImageAdd costs $59, and LocalViewer is priced at $59.

Computer Clearing House: (716) 334-4191.

■ *Last week,* **Informix Software, Inc.** *unveiled plans to license mobile networking client software from* **MobileWare Corp.** *for integration with Informix database and development tool products. Informix is also planning to make an equity investment in MobileWare.*

■ **Powersoft Corp.** *in Concord, Mass., has begun shipping* **PowerBuilder for Unix,** *a version of its application development tool for SunSoft, Inc.'s Solaris. Since the Unix and Windows versions share a common code base, developers may deploy applications across platforms with few changes.*

PowerBuilder for Unix costs $3,295.

Powersoft: (508) 287-1500.

■ *McLean, Va.-based* **Compusearch Software Systems, Inc.** *last week announced ImageFast 3.0, the new version of its Windows-based* **document management** *software. Version 3.0 now works with any Open Database Connectivity-compliant database.*

The software also has a new user interface, improved indexing capabilities and scanning support.

ImageFast 3.0 costs $2,295 for a stand-alone version; multiuser pricing starts at $4,995 for five users.

Compusearch: (703) 893-7200.

Database vendors flesh out their OLAP plans

Technology will help in analysis of networked databases.

By Barb Cole

Now that the top three database makers have snapped up smaller firms that specialize in on-line analytical processing (OLAP) software, the data warehousing strategies of the database giants are starting to gel.

The most recent move came last month when Informix Software, Inc. acquired Stanford Technology Group, a San Francisco maker of OLAP tools.

The deal was expected, considering Oracle Corp. bought a division of Information Resources, Inc. (IRI), which markets a suite of OLAP software, in June. And early last year, Sybase, Inc. purchased key query acceleration technology and has since discussed plans to build its own OLAP tools.

The vendors are keen on supporting OLAP capabilities, which let users perform complex analysis of networked databases — a key to constructing data warehouses. In the past, administrators typically had to move operational data out of relational systems and into specialized OLAP databases to provide that kind of analysis, but it proved to be expensive and tricky.

OLAP comes into the mainstream

Company	OLAP strategy	Delivery date
Informix	Integrate technology acquired from Stanford Technology into its OnLine database.	Hasn't been disclosed.
Oracle	Incorporate OLAP software acquired from IRI Software with its Oracle7 database. Plans to deliver a SQL gateway into the IRI Express OLAP server and incorporate multidimensional capabilities directly into the Oracle database.	SQL gateway due by September 1996, while the database will gain multidimensional capabilities within two years.
Sybase	Deliver Sybase IQ, a database add-on for speeding large queries, and Highgate, an OLAP middleware layer for databases.	Q1 1996 for Sybase IQ; sometime next year for Highgate.

In the cases of Informix and Sybase, the strategies are to let users access their relational data directly through an OLAP layer. Oracle is looking at giving users a choice of keeping some data in the operational storehouse or moving it to a specialized OLAP database.

Both approaches aim to obviate the need for a monolithic data warehouse.

"The reason they're trying to eliminate the stand-alone data warehouse is that it may take $2 million to $3 million and two or three years to build one," said Robert Scheier, an analyst at Hurwitz Consulting, Inc., a Watertown, Mass., consultancy.

Company plans

Susan Nurse, strategic alliances manager for warehouse marketing at Informix, said the company endorses relational OLAP and will use the Stanford technology to extend its OnLine database to be a fully multidimensional server. OnLine already works with the Stanford products, but further work on integration is expected to get under way in 1996, she added.

"We haven't decided on the physical packaging," Nurse said. "It's possible that we'll have a [special] data warehouse server,

See **OLAP**, *page 34*

NetworkWorld ON LINE Fusion

New to OLAP? Download a primer and glossary. Link to http://www.nwfusion.com. From the main menu, select News+ then Client/Server Applications.

Software to give apps transaction processing hooks

By John Cox
Brisbane, Calif.

USoft next week will introduce software for linking client/server applications to network-based transaction processing (TP) services.

This means that client/server developers will be able to call an array of vital transaction and related application services, instead of writing them in database code. The result will be distributed applications that can handle more complexity and larger transaction loads than typical graphical user interface (GUI) applications linked to one database.

USoft's OnLine Server, which includes Novell, Inc.'s Tuxedo TP monitor, extends USoft's model-driven development and deployment software to support on-line transaction processing (OLTP) on Unix, Windows NT and mainframe systems.

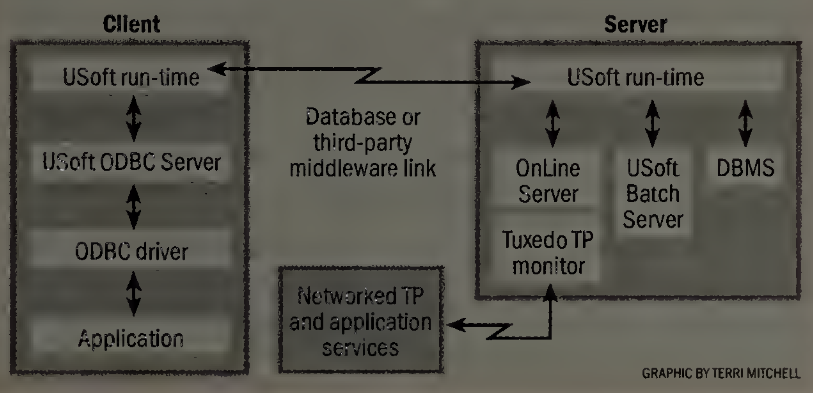
"They're integrating transaction management into their development environment, something which isn't handled very well by virtually every [fourth-generation language] that's out there," said Mark Hanner, program director for application development strategies at META Group, Inc., a Stamford, Conn., market research company.

That integration is essential for building large, distributed applications that handle transactions. "When you get into high-performance processing with thousands of users, you end up needing a transaction monitor,"

See **USoft**, *page 34*

Taking a 'server/client' approach

The USoft tool set lets developers build applications from the server outward, first defining the data model and then a set of business rules to express the model. The generated GUI screens interact with the client- or server-based run-time environments for database access, batch processing and so on. USoft's new OnLine Server ties in transaction and network services.



GRAPHIC BY TERRI MITCHELL

Lotus to port Notes onto Digital's Alpha

By Carol Sliwa
Cambridge, Mass.

Lotus Development Corp.'s plan to port Notes to Digital Equipment Corp.'s Alpha-based systems is being hailed as a win for both companies.

Digital gets more independent software vendor support for its 64-bit hardware. And Lotus not only will be able to provide its customers with another platform choice, but analysts said the Notes implementation should enhance the groupware application's scalability and performance.

"Let's put it this way: If applications such as Notes cannot perform better on Alpha than on Intel [processors], then Alpha is not going to survive," said David Marshak, vice president and senior consultant with Patricia Seybold Group, Inc. in Boston.

Lotus expects to deliver the Alpha version of Notes for Windows NT during the first half of 1996. Plans call for a Digital Unix version to follow during the second half of the year.

Duncan Anderson, director of Digital's alliance and market

See **Lotus**, *page 34*

Excalibur thrusts new info retrieval tools into market

By Barb Cole

San Diego

Excalibur Technologies, Inc. last month rolled out a package of information retrieval software that includes a module for building Web-based applications.

The offering, called RetrievalWare, also includes APIs, a relational database gateway and several search engines for building Windows or Motif-based applications that enable end users to search for text, image and even voice information across a network.

RetrievalWare represents the melding of Excalibur's retrieval products with an informational retrieval software line it acquired from ConQuest Software, Inc. in July.

RetrievalWare's hybrid search engine employs several sophisticated methods for mining data, such as recognizing digital patterns and the meanings of many words. These techniques ensure accurate searches and minimize the amount of information passed over the network, according to company officials.

Web standout

A highlight of the new package is the company's new Web Server, which generates HyperText Mark-up Language pages that are passed to a HyperText Transfer Protocol server and interpreted by a Web browser. The secure Web Server supports plain English searching and may be integrated with Excalibur's image and voice retrieval servers or the company's Electronic Filing Software for delivering document imaging to desktop users.

Eric Brown, a senior analyst at Forrester Research, Inc., a market research firm in Cambridge, Mass., said RetrievalWare Web Server can provide developers of public and internal Web sites with a much-needed tool to give end users for mining the contents of the Web.

"This kind of tool is absolutely necessary because when companies try to scale up their Web efforts, the number of Web pages and hyperlinks becomes too daunting to navigate and maintain," Brown said.

EXCALIBUR'S RETRIEVALWARE COMPONENTS

- ▶ Software developers' kit
- ▶ Text Servers
- ▶ Web Server
- ▶ Image Retrieval Server
- ▶ Electronic Filing Software

Company officials said future releases of RetrievalWare will incorporate Excalibur's fingerprint and image retrieval servers.

Available now, RetrievalWare and the RetrievalWare Web Server run on Unix and Windows NT servers, and on Windows and Unix clients. Pricing is $5,000 for the RetrievalWare software developers' kit and $12,500 for the RetrievalWare Web Server.

©Excalibur: (619) 625-7900.

OLAP

Continued from page 33

but I could also see it being an add-on."

Sybase plans to make its SQL Server database a more attractive data warehousing platform when it releases an OLAP middleware layer code-named Highgate sometime next year, according to company officials.

Highgate is expected to create a set of addresses and indexes that point to the live data on the relational databases. The middleware also will work with Sybase IQ, a database add-on designed to speed complex queries that is due early next year.

Oracle's acquisition is somewhat unique in that it purchased a stand-alone OLAP database as well as a suite of OLAP tools from IRI.

"The Oracle position [on data warehousing] is simple," said Jeff Stamin, senior vice president of OLAP at Oracle. "Sometimes you can do what you need to do against relational data, and sometimes you want to stage the data in a multidimensional [database]," he said.

To that end, Oracle will offer by next year a SQL gateway into the IRI Express OLAP server, which will let users query data in the OLAP server as though it were stored in Oracle7. In the longer term, the company will offer a multidimensional data store as an option to its core database. It will not require moving the data to a separate server, Stamin said.

Users are encouraged by the prospect of getting OLAP capabilities in relational databases. "We'll be using the best tools, but if they come from our database provider, they'll be easier to integrate," said Barbara Hirstius, information technology consultant for data warehousing administration at Entergy Corp., a New Orleans-based utility that has about 600 users on a Sybase SQL Server data warehouse.■

Lotus

Continued from page 33

development group, said no hard facts are available now, but he expects the Alpha-based versions of Notes will help companies consolidate Notes servers and ease management of them.

Stephen O'Neill, vice president of strategic alliances at Lotus, said performance problems with Notes had nothing to do with the company's decision to develop the first implementation of the 32-bit Notes program for a 64-bit hardware platform.

"We don't know, quite frankly, what the difference between an Alpha platform and another platform is going to provide us at this point," O'Neill said. "And that is not the reason we would go into this. We're going into this because there's enough people out there that are using the Alpha platform that want Notes running on it."

Marshak said the Lotus-Digital partnership could be viewed as a "slap" at Microsoft Corp. He said Digital had been "very much seen" in the camp of the Redmond, Wash.-based software giant, which is coming out with Notes challenger Exchange Server early next year.

"On the other hand, just remember who makes money every time you run Notes on top of Alpha," Marshak said. "It could very well be that Microsoft will make more money than either Digital or Lotus. They just want NT servers all over the place."■

USoft

Continued from page 33

Hanner said. "There aren't many client/server systems in that range."

Introducing 'server/client'

USoft was formed by Unisys Corp. after it bought established Dutch tools vendor TopSystems International earlier this year. TopSystem's tool kit, now called USoft Developer, is used by more than 300 customers worldwide and has been rated highly by several technology research companies. But it is almost unknown in the U.S.

That may change as developers become aware of what USoft officials call the "server/client" approach: The tool set focuses on designing high-level business rules, leaving the generation of the needed client GUI screens until the end of the process.

Working with the tool kit, developers diagram a model of the application. The model, and its business rules and logic, are expressed as a set of SQL rules that are stored in a flat file repository on server and client computers. A run-time environment on each computer processes the rules in response to end-user actions.

OnLine Server for Tuxedo is the first of a new middleware product line designed to create a two-way link between applications built with USoft Developer and outside services — in this case, the Named Services of the Tuxedo OLTP environment.

In addition, OnLine Server has gateways to mainframe CICS and IMS, as well as to OLTP monitors that support the Open Systems Interconnection TP protocols.

USoft is talking with other vendors of TP monitors and message-oriented communications software. In the future, these vendors' technologies could be added to the OnLine Server family.

Also, USoft next week will unveil USoft Benchmark for automating software testing procedures and analyzing end-user applications.

USoft OnLine Server will be available on Windows NT by year-end and on Unix by March. Prices start around $5,000. USoft Benchmark is available now at $4,000 per developer.

©USoft: (415) 875-3300.

Vendor to put client/server apps on the map

By John Cox

Troy, N.Y.

MapInfo Corp. next month will ship a new version of its desktop mapping software that includes a series of changes designed to link the product with client/server development tools and a broader range of networked data sources.

The changes in the new version, now called MapInfo Professional, could spark a much wider deployment of applications that make use of geography. Information such as street addresses could be employed to help users integrate and then visualize data pulled from networked databases, according to analysts and users.

An added spark is expected from Microsoft Corp. licensing part of MapInfo for and including it in the Excel spreadsheet and Microsoft Office 95 products.

MapInfo Professional lets developers create applications with various third-party tool sets, such as Powersoft Corp.'s PowerBuilder and Borland International, Inc.'s Delphi, and connect with MapInfo capabilities via Dynamic Data Exchange links on the network or via OLE 2 interfaces on the desktop. Previously, mapping applications could only be written in the MapBasic language.

The new version also is a 32-bit application that will run on Windows 95 and Windows NT.

Also new is the ability for a MapInfo client to directly and simultaneously access remote relational databases. Different types of data can be retrieved from several databases and then displayed on a map without having to run a lengthy database join on the PC, according to Randy Drawas, vice president of marketing communications for MapInfo.

A related new feature, called conflict resolution, calls back to the networked database if the user makes a change to the downloaded data. If this original data has been altered, the change can then be downloaded to the desktop.

Opening up

Home Savings of America, a savings and loan bank based in Irwindale, Calif., is beta-testing MapInfo Professional. The new release "is designed to keep the architecture a lot more open," said Andrew Barker, a programmer analyst at the bank. "I can harness the power of a [rapid application development] tool like Delphi and then leverage MapInfo for mapping, and have a choice of database connectivity. We're at that crossover point from MapInfo being a nifty looking tool to being a real productive tool," he said.

MapInfo Professional will be available in December on Windows platforms and cost $1,295. The MapBasic Development Environment, with an improved version of MapBasic, costs $795 and will ship at the same time.

©MapInfo: (518) 285-6000.

SHARED LOGIC

Betting on the future? Include Oracle, Novell in picks

Las Vegas is a place where people go to test their skills at predicting the future. At last week's Comdex/Fall '95 show, Oracle Corp. Chairman and CEO Larry Ellison and Novell, Inc. Chairman and CEO Robert Frankenberg aired their best guesses about the future of computing.

Fortunately, their ideas about what's to come are not just logical extensions of their current product lines. Instead, they are inventing new solutions, unbound by the legacy of their extant successes.

Ellison focused on his vision for networks: Deliver a superlow-cost, high-performance client — a "networking machine" that is designed for the single purpose of establishing high-speed network connections.

Such a machine would blend the best features of PCs and host terminals, Ellison said. And it could be priced at as little as $500 and boast a screaming-fast 220-MHz processor, 4M bytes of flash RAM and built-in Asynchronous Transfer Mode networking software.

Marc Myers

The net device would give you access to remote services that provide client/server applications, storage and an operating system. For example, your word processing program and all your documents could be stored on a server and accessed via a high-speed connection.

You simply would pay a subscription fee to access the network. This would eliminate the unexpected costs that accrue whenever you have to upgrade your software or hardware. All the upgrades would take place on the server, so you could take advantage of an upgrade automatically whenever you logged on. It would make the cost of owning computers completely predictable.

I had to admire Ellison for his complete lack of hesitation to enter the hardware marketplace. But his concept is so clever and obviously marketable, that it is bound to be successful.

Frankenberg's keynote presentation outlined Novell's plan for global internetworking. He finally put into perspective what the real problem is with our current low-cost interconnectivity options: They don't work for business.

Frankenberg's answer is NetWare Connect Service, which is in beta-test and will be available next month. This public client/server application service allows end users on private NetWare networks to communicate with one another and with the Internet via a single connection to a local carrier. AT&T will provide the service in the U.S.

The power of this vision rests in its speed, manageability and security. It's a solution for business. The beta test going on at Hallmark Cards, Frankenberg said, "gives them all the benefits of a private network and will save $150,000 to $200,000 per year in overhead."

Frankenberg's goal is to make the network easy to use. Key to this strategy, he said, is NetWare Directory Services, which "helps you find what you need, allows others to see only what you want them to see, guarantees data integrity and enables service providers to deliver content."

Novell is looking far beyond the LAN, pushing the ease of use, security and reliability features of NetWare out to the WAN, at a reasonable cost. This is exactly what business needs.

Myers is president of Client/Server Connection, Ltd., a Cambridge, Mass., firm specializing in client/server software solutions. He can be reached at (800) 622-1108, Ext. 522, or via CompuServe at 71332,1726. Myers' column alternates in this space with that of META Group's Mike Rothman.

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Electronic Commerce

Covering: Tools and Techniques for Interenterprise Networking
and Doing Business On-Line

Briefs

Starfish Software, Inc. *of Scotts Valley, Calif., last week at Comdex/Fall '95 announced* **Dashboard 95 Web Edition,** *an implementation of its graphical desktop organizer tailored to Internet activity.*

Starfish: (800) 765-7839.

A three-dimensional World-Wide Web browser *made its debut at Comdex/Fall '95 last week as the joint effort of partner firms Integrated Data Systems, Inc. of Savannah, Ga., and Portable Graphics, Inc. of Austin, Texas.*

The product, called VRealm, is based on the Virtual Reality Modeling Language and uses Silicon Graphics, Inc.'s Open Inventor 2.1 rendering techniques. A beta version of VRealm is available on-line at http://www.idsnet.com or http://www.portable.com.

IDS: (912) 236-4374; Portable Graphics: (512) 719-8000.

O'Reilly & Associates, Inc. *of Sebastopol, Calif., expects to ship in January an update to its 32-bit* **multithreaded World-Wide Web server,** *WebSite, and later release an advanced version with enhanced security functions. WebSite Professional is scheduled to ship in the first quarter of 1996.*

O'Reilly: (707) 829-0515.

Accent Software International, Ltd *is offering a* **World-Wide Web browser utility** *called the Accent Viewer that supports viewing of documents in multiple languages, including Russian, Arabic, Hebrew, Greek and Spanish. The Viewer can be downloaded from Accent's Web site at http://www.accentsoft.com.*

AT&T needs to put some meat on its EC bones

By Joanie Wexler
Las Vegas

AT&T last week sprinkled some more details on its electronic commerce strategy.

The carrier announced two new services that eventually will merge and allow consumers accessing an AT&T business customer's World-Wide Web site to complete a transaction.

The carrier's announcements last week at Comdex/Fall '95 left industry observers with two outstanding concerns. First, AT&T has a big job ahead to prove its Internet competency. Second, the delay before its services become commercially available late next year could cause AT&T to lose customers who dare not be left behind in the Internet craze.

The first offering, AT&T Easy World Wide Web Services, is AT&T's Web creation, hosting and management service. Outsourcing Web tasks means businesses can publish on the Web without capital investment, explained Kathleen Earley, vice president of AT&T's multimedia groupware services.

She added that AT&T will provide bandwidth to businesses' Web sites as needed and manage server capacity. Someone accessing an AT&T-hosted Web page "will never see a 'server unavailable' situation," Earley pledged.

Pricing details were not available, but Earley promised, "It will always be more cost-effective [to use AT&T's Web hosting services] than to bring a Web server in-house and hire a staff."

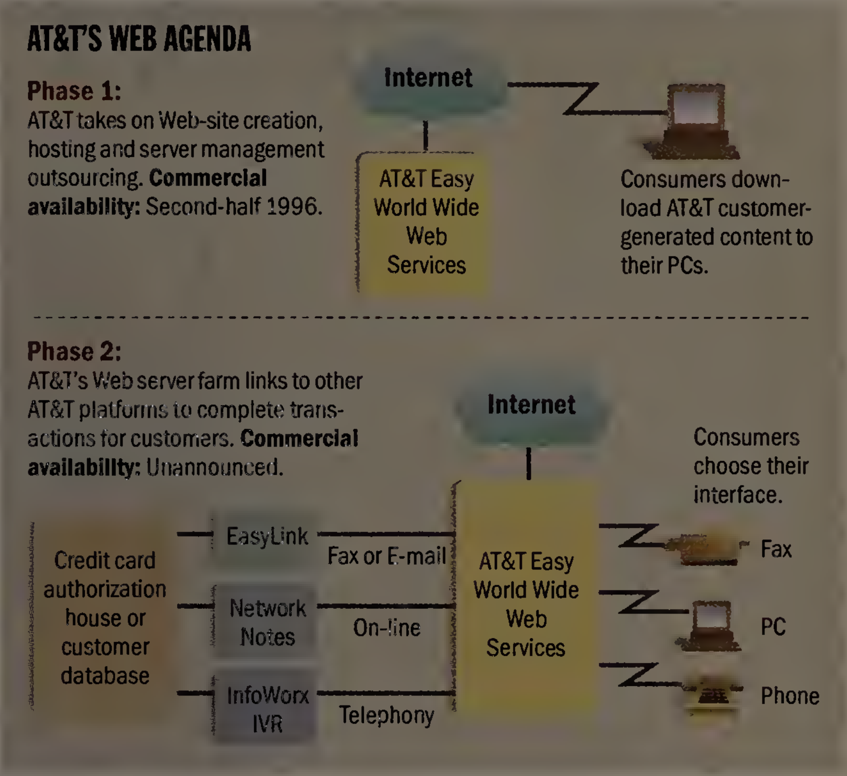
Meanwhile, AT&T also launched its Electronic Commerce Solutions-Transaction Platform, a separate service that initially will lack Internet links.

This service creates an electronic commerce marketplace where users can complete transactions via AT&T's existing InfoWorx interactive voice response (IVR), EasyLink and Network Notes platforms.

To order, consumers can use a telephone, fax or computer/modem interface.

The long-term vision is to link

See **AT&T,** *page 71*



AT&T'S WEB AGENDA

Phase 1:
AT&T takes on Web-site creation, hosting and server management outsourcing. **Commercial availability:** Second-half 1996.

Phase 2:
AT&T's Web server farm links to other AT&T platforms to complete transactions for customers. **Commercial availability:** Unannounced.

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InfoWorx IVR
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AT&T Easy World Wide Web Services
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BUSINESS SPACE

Stating the case for the state

Last week, I wrote about a needed feature for Web servers called a shopping basket. Just to recap: A shopping basket is required to store items you select on a Web site so you can act on them as a group — for example, to purchase them or perform a bulk retrieval.

Mark Gibbs

The problem with implementing shopping baskets on Web servers lies in the fact that Web servers are stateless. To put it more simply, clients (browsers) don't have a session with a server for the duration of a sequence of interactions. This means that every request made to a Web server is as if the server has never seen you before.

So if you want to select an item from one page, an item from a different page and so on, then information that identifies your session and can be used to track the items you want remembered (that is, the contents of your shopping basket) needs to be kept somewhere.

The solution to this problem has to be implemented outside of the Web server. (Making the server stateful would require a complete redesign of both the server and client.) So before we can fruitfully discuss shopping baskets, we need to solve the issue of Web server statelessness.

The answer to this problem is to place the state information in the data that is passed between the server and the client. The technique is to identify each new session with a "token" — simply a sequence of characters used for identification — that is unique to that session.

The way in which that token is used is to append it to every URL in every page retrieved by that session.

For example, a URL in a page that reads "http://www.widget.com/doc3.html" might become "http://www.wiget.com/doc3.html?a34by7" where the "a34by7" is the token.

Obviously, when a browser first talks to a server and the home page is requested, there won't be a token in the requested URL. This is OK since retrieving the home page is the primary way that a new session is started.

Any link from the home page and, for that matter, from anywhere in the site is handled by a back-end application that manages tokens. The application looks for tokens and, if there isn't one, creates a new token.

Token creation might involve registering the token string and associated data — time of creation, last use time, browser type, etc. — in a database. Or it could be done differently; it is possible to embed all of the session data in the token, although there are cases where this could lead to excessively long URLs.

On the other hand, if a token is found, the back-end process validates it.

The kind of checks that are made might include verifying the age of the token or seeing if data structures associated with the session still exist.

Now you might think you could check if the IP address associated with the session has changed, but this won't do you any good because IP addresses can be allocated dynamically or shared.

Once we have a session token allocated, the back-end application can process every page requested and modify the URL in each HREF, ACTION and so on before sending the data on its merry way back to the client browser.

So we have solved the problem of making Web server interactions stateful. Next week: Shopping baskets and the time-honored question, paper or plastic?

If you send Gibbs a joke, he'll send you one back. Lay it on him at mgibbs@gibbs.com. You can also tell him one by calling (800) 622-1108, Ext. 504, but unless it is really good, he won't call you back.

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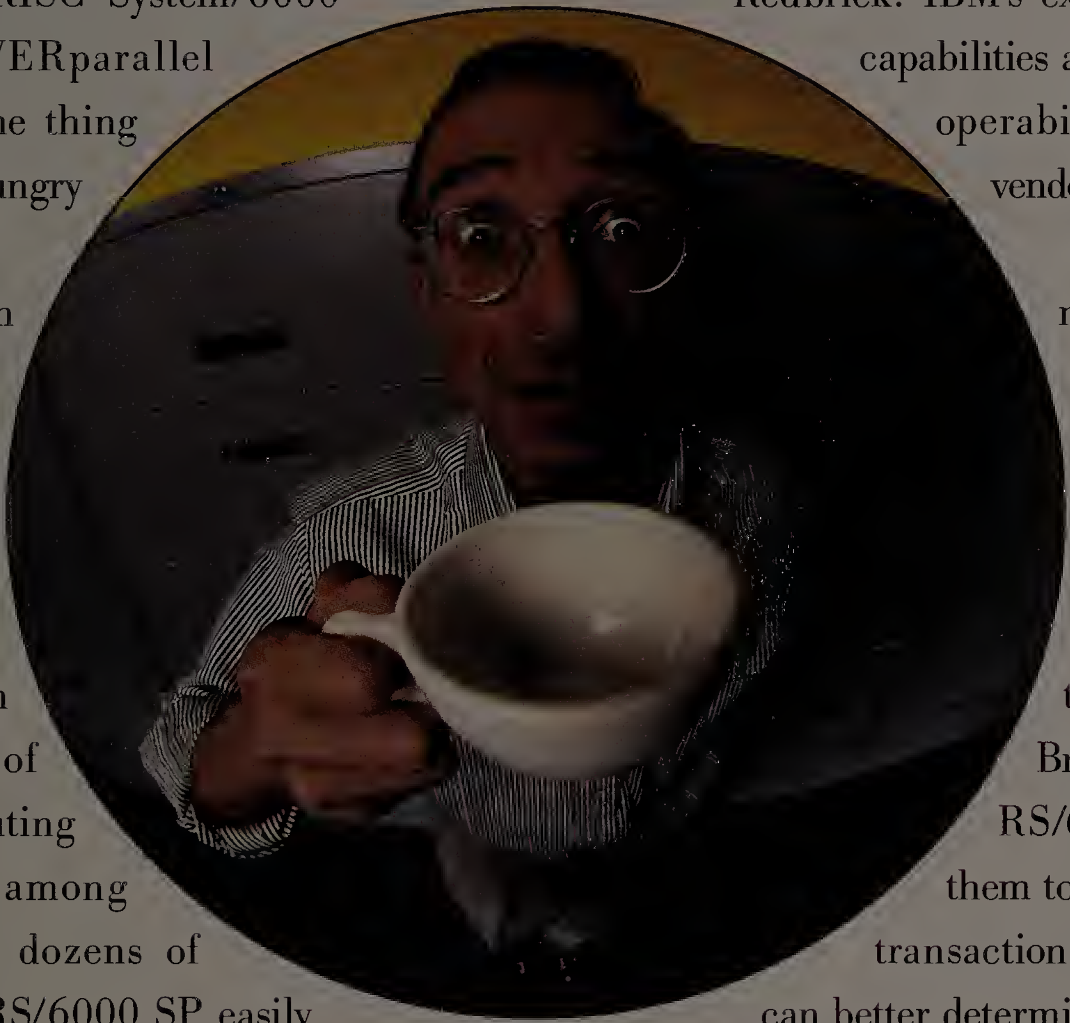

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Champions of Cyberspace

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Arts and Entertainment
HotWired

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The National Materials Exchange Network

Community
The Alzheimer's Disease Support Center on the Cleveland Free-Net

Education
The DO-IT Program

Government
The Utah Library Network Initiative

Health
The Information Network for Public Health Officials

The National Information Infrastructure (NII) Awards *recently honored six organizations for outstanding uses and applications of the Information Highway. The Awards ceremony featured Secretary of Commerce Ron Brown, former US Surgeon General Dr. C. Everett Koop, AT&T Chairman Robert Allen, Academy of Television Arts & Sciences President Rich Frank and, via video, Vice President Al Gore. The winners were chosen from a field of 550 Nominees ranging from uses of bulletin boards to broadband.*

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How do I add another partition, or more space to an existing partition, on a Novell, Inc. NetWare 4.1 server?
Via Network World Fusion.

You can only have one NetWare partition per physical device, according to Ron Nutter, an Enterprise Certified Novell Engineer in Lexington, Ky. Therefore, your only option is to increase the size of an existing partition.

To do so, you must delete the partition and then recreate it. Unfortunately, you have to delete all volumes and data stored on this drive. So before you make any changes to the partition, create at least one tape backup of the volume that has been compared to the drive.

Once your partition is changed, you can restore the lost data from tape.

Do you know of any upcoming trade shows or conferences where I can get information about access equipment for cable television, telephony and interactive networks?
Kevin Bloch, via Network World Fusion.

Check out the California Cable Television Association's annual Western Show, which will be held Nov. 29 to Dec. 1 in Anaheim, Calif. For more information, call Trade Associates, Inc. at (301) 468-3210. To see a program and exhibitor's list, use its fax-on-demand service at (303) 575-6127.

You also might want to attend Building Industry Consulting Service International, Inc.'s (BICSI) Opening Doors Winter Conference Jan. 15-18 in Orlando. Call BICSI at (800) 242-7405.

For details on more than 600 worldwide tradc shows, check out Tech Trade Associates' calendar. The 1996 poster-size calendar, priced at $39.95 plus $5 for shipping, cross-references trade shows by subject, location and date.

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New configurations make FDDI more survivable

Alternate-path FDDI focuses specifically on mission-critical applications, providing four paths into the network.

By Hank Heneghan

For years, FDDI has been offering companies the ability to support data transport at 100M bit/sec over highly reliable links. Now the technology can offer even greater levels of redundancy to keep operations intact at all times.

While still complying with standards, vendors have begun making FDDI more survivable than in previous configurations.

In a basic FDDI configuration, the backbone is made up of a set of dual-attach stations (DAS) interconnected in a ring. This provides a level of reliability suitable for many business applications.

However, if a double fault occurs in the cable plant, the ring will segment and the network will be disrupted. Accordingly, many users opt to implement FDDI's standard dual-homing capability to counter this real possibility.

Dual homing

Under dual homing, the A and B ports of DAS nodes are connected to the M ports of two different dual-attach concentrators (DAC).

In turn, the concentrators are linked to each other through their own A and B ports.

The Station Management Topology process spelled out in the FDDI standard controls the timing on the rings. It allows only one connection between the DAS and DAC to be live simultaneously.

If the primary port connection fails, the backup port picks up, providing a redundant path from the station to the ring.

However, only one continuous path exists between the DACs. If the trunk ring is cut at multiple points, then the network will segment into isolated units.

While this configuration allows yet another level of redundancy, it still doesn't address those mission-critical applications that require the utmost in reliability.

Disruption of the data flow to an air traffic control center, an on-board ship network or a stock market trading desk, for example, could have dire consequences.

A dual-homing configuration could protect only these applications from two faults occurring on the FDDI ring. More than two faults could bring the operation to a halt.

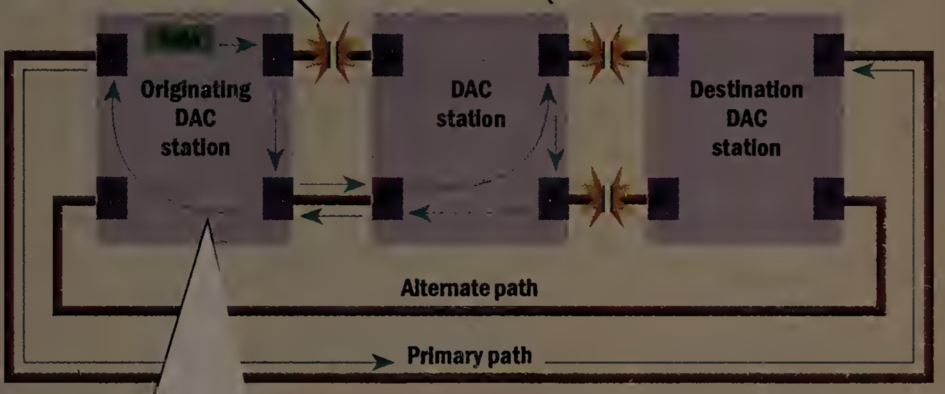
UP CLOSE

Survivable FDDI

Workstations become dual-attach concentrators (DAC) when outfitted with network interface cards that have typical A and B ports plus two M ports, all of which are bidirectional. The four ports make it possible to maintain connectivity even if there are three or more cable breaks. This differs from dual-homing schemes, which can leave stations isolated if two connections are broken.

1 If the primary path is severed between two DAC stations, the sending station will pass the data to the alternate path. In this case, the originating DAC station will send its transmission through the B port.

2 The next DAC station in the chain will try to move the data back onto the primary path. If the primary path is not available, it will transmit the data to the alternate path. If that path is also out of service, the station will reverse the traffic flow so the data can be sent around the ring in the opposite direction.



3 Upon receiving the data through the alternate path, the originating DAC station will move it through the M port connected to the primary path, which switches direction, for transmission to the destination station.

To further protect data, another variation of this dual-homing scheme can be used.

While the DAS nodes still connect to two different DACs, the concentrators now attach to each other using a second, alternative path.

These M port connections provide two continuous paths that prevent the ring from segmentation even if any three connections fail. However, an individual station still can be isolated from the rings if its two attachments are broken.

Survivable FDDI

In treating every station on the ring as a concentrator, alternate path, or survivable, FDDI focuses specifically on mission-critical applications.

Here, all the DAS nodes are provided with two M ports, which typically are only found in concentrators.

In effect, each station acts as a DAC and is interconnected using the alternate path FDDI topology.

In this configuration, each DAC station provides four paths into the network rather than the typical two.

Triple jeopardy

This network can survive a minimum of three cable breaks anywhere in the ring.

In fact, depending on the location of the breaks, the network may survive up to N+1 cable breaks (where N is the number of DAC stations).

Although triple faults in a network are rare, they are possible. For example, a construction contractor digging a trench near your building could sever two fiber links at the same time MIS has taken another link out of service for maintenance.

Under such conditions, typical FDDI configurations would fold. Alternate path FDDI would ensure the continued flow of data.

Granted, the risk of these events occurring simultaneously may be low, but the consequences of losing data links in mission-critical applications more than offset the costs. If your data absolutely has to get there, then a survivable FDDI topology could provide the guarantee you are looking for.

The U.S. Navy has adopted this solution for providing literally bulletproof networks for connecting workstations aboard its warships.

FDDI does have worthy competitors — Asynchronous Transfer Mode, 100M bit/sec Ethernet and 100VG AnyLAN — in the high-speed LAN arena.

But FDDI offers considerable redundancy and reliability capabilities that network managers charged with maintaining connections for mission-critical applications should carefully examine.

Heneghan is product marketing manager for Performance Technologies, Inc., a Rochester, N.Y.-based supplier of survivable FDDI and other networking products.

EDITORIAL INSIGHTS

A contender to watch

When you think about companies that will dominate the LAN management market in future years, who comes to mind? Novell, Microsoft, Intel, Computer Associates, maybe some others.

How about Seagate Technology? That's right, the $5 billion manufacturer of disk drives.

During the past couple years, Seagate has quietly snapped up an array — no pun intended — of interesting companies and technologies for systems, storage and network management that it plans to weave into an integrated LAN management offering.

Seagate has acquired LAN management vendor Frye Computer Systems (May 1995); Unix net management supplier NetLabs (March 1995); Network Computing, a provider of NetWare management tools (January 1995); Palindrome, a storage management firm (July 1994); and Crystal Computer Services, which makes data access and reporting software (May 1994). If its merger with Conner Peripherals goes through in early 1996 as planned, Seagate also will get Conner subsidiary Arcada, which makes storage management systems.

These may not be household names, but they form a rich set of technologies that gives Seagate some interesting advantages. For example, the NetLabs NerveCenter technology has been embraced by platform vendors such as HP and SunSoft, so anything Seagate does at the LAN level will tie in to the enterprise.

The key now is to tie all of these products together in a way that makes it easier for customers to manage not only net components, but also competing systems and applications. NerveCenter and Network Computing's LANAlert products are already being blended to help companies manage IP and IPX networks.

But that's just a tactical first step. Seagate is brainstorming now — internally and with customers — on a broad integration strategy that it will likely reveal early next year.

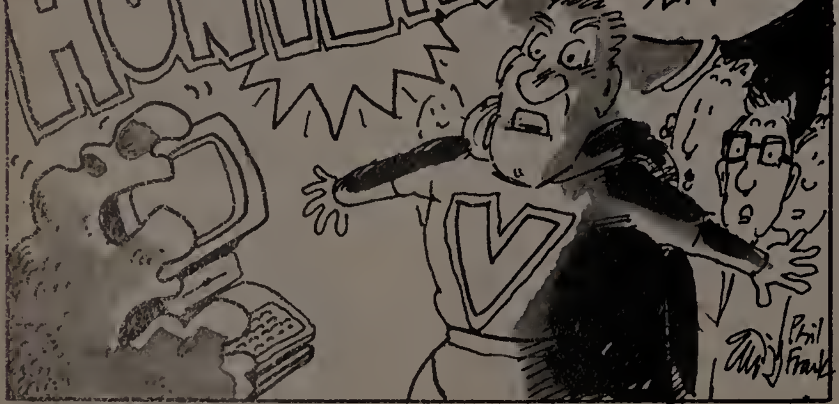
If you're in the market for a LAN management system, get a briefing from the obvious names on what their platforms can do today and how they will evolve to support integrated network and systems management. Our Buyer's Guide on page 45 will help you get going.

Talk to Seagate, too. In fact, now's a good time to give them ideas that can help them deliver a better system down the road.

John Gallant, editor in chief jgallant@world.std.com

Teletoons

By Phil Frank and Joe Troise
guru@well.com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SPEAKING THE LANGUAGE

Users struggle to balance freedom of choice with interoperability

Linda Musthaler

To borrow a phrase from the Rolling Stones, "You can't always get what you want." Unfortunately, that lament seems to apply particularly to well-integrated products and platforms from the network industry.

On the one hand, the issue is choice. Most of you appreciate the option to choose the products you use and the vendors from which you buy them. On the other hand, the issue is interoperability and making all those products of choice work together smoothly.

Wouldn't it be nice if you could have both choice and interoperability? Some vendors are working toward that utopian world, but take my advice, don't fire your systems integrator just yet.

In the past decade, we've witnessed the rise of hundreds of vendors and tens of thousands of network products. The choices are staggering. So are the interoperability issues. When you pick one component from Column A and another from Column B, you're likely to discover the resulting configuration doesn't work exactly as expected.

The leading vendors in the computing industry are making a concerted effort to reduce compatibility problems and promote interoperability.

Individually, many vendors spend millions of dollars a year testing their products in conjunction with third-party products. I've toured vendors' laboratories where there are rooms full of computers that are simulating the common, and often not-so-common, configurations and scenarios of the vendors' customers. You can take advantage of such resources to help solve your integration problems.

Compatibility testing is great, but it doesn't eliminate the fact that vendors like to travel down disparate technology roads.

For instance, Compaq Computer Corp. has a LAN test facility that it rents out to customers that want to conduct their own tests involving Compaq equipment. Servers are configured according to the customer's needs. NOSes run the gamut from NetWare to Unix, with everything in between. And applications of all shapes and sizes can be put through the ringer. You can give your recreated network a realistic shakeout with no impact on your production environment.

Other vendors attack the compatibility issue at the software level. Novell and Microsoft attempt to head off problems through their Yes and Windows 95 logo programs, respectively. Third-party application developers must meet some pretty stringent criteria to advertise their products with Novell's or Microsoft's logo on the box.

Novell provides technical support for third-party products tested under its "Yes, it's tested and approved" program. The Yes program assures you that the Novell environment you must manage has been thoroughly tested and is well supported.

Compatibility testing is great, but it doesn't eliminate the fact that vendors like to travel down disparate technology roads. This is not necessarily bad, as it spurs innovation and competition.

However, the development of different standards eventually leads to the need to bridge the gap between them.

The formation of vendor coalitions or alliances seems to be an industry trend for resolving technical disparities. Vendors with similar or even competing technologies hack out the lowest common denominator acceptable to everyone. This base level of agreement becomes a standard for vendors to build on while leaving room for them to add minor improvements along the way to create unique value in their products.

Despite these Herculean efforts, the problem is clear: Products from different vendors don't always work together. What can you do?

One obvious choice is to work with a well-established systems integrator that can fit the pieces together like Lego blocks. Get out your checkbook though, because integration expertise is not cheap. Unless, of course, you can get it for free. Some vendors work closely with strategic accounts that offer the potential for significant business. That relationship may include free or low-cost integration consulting in exchange for a long-term commitment to the vendor's products.

One company I've worked with was fortunate enough to have support engineers from the application, NOS and hardware vendors on-site or on call during key implementation phases. Integration issues could quickly be addressed and resolved. In return, the customer is a "referenceable" account for those vendors, openly talking about the benefits of the new system to other potential customers. Moreover, the customer's gratitude will be reflected in long-term purchasing loyalty.

Union Carbide seems to be taking a unique approach to integration problems — it's heading them off at the pass (*NW*, Aug. 7, page 1). The company is ripping out all its disparate systems and standardizing on one platform for an internetwork spanning North America.

The new platform is based on Windows NT at the server, Windows 95 on the desktop and Compaq servers running Microsoft's BackOffice applications suite. Granted, this is a multimillion-dollar undertaking for Union Carbide, but the company sees tremendous benefit in standardizing on an industrial-strength, homogeneous environment. Surely one of the top benefits and a source of long-term savings is a greatly reduced need for systems integration.

Of course, it's not practical for most companies to throw away existing systems and start over from scratch. That's why you should limit the number of vendors and products you work with, and choose your partners carefully. If not, you might end up singing, "I can't get no satisfaction."

Musthaler is vice president of research at Currid & Co., a Houston-based technology consulting firm. She can be reached at (713) 789-5995 or via the Internet at musthaler@ngwgate.mhs.compuserve.com.

GET WIRED

High-speed LANs over Category 3: The Good, the Bad and the Ugly

Kathryn Korostoff

High-speed LANs running over Category 3 wiring are, at best, a way for networking vendors to avoid media-related sales objections when selling their 100M bit/sec-plus wares. At worst, the configuration is a marketing ploy that will fall short of vendors' sales forecasts and leave many of you feeling like you've had an unfortunate run-in with Clint Eastwood's "The Man with no Name."

Many vendors are proudly waving their ATM-over-Category 3 flags because they assume that many of their Asynchronous Transfer Mode prospects are heavily entrenched in Category 3 unshielded twisted pair. Let me be the one to break the bad news: Most organizations with more than 1,000 employees already have a substantial amount of Category 5 installed in their horizontal wiring subsystems.

In fact, in a recent Sage Research, Inc. survey of 126 network professionals, 71% reported they are using Category 5. Granted, there are some significant differences in current Category 5 use by vertical industry. Government agencies, for example, have a lower use than industries such as financial services. But unless a networking vendor plans to sell its products to only one or two particular industries, offering high-speed LANs over Category 3 wiring isn't a strategy for achieving record-breaking sales. Networking vendors targeting the Category 3 installed base with 100M bit/sec LAN products (either ATM or fast Ethernet) will be disappointed.

Actually, more organizations still have thin coaxial cable than have Category 3. Sage's research reveals that many companies skipped from thin coaxial to Category 5, leapfrogging over Category 3. An impressive 37% of surveyed organizations reported that they have thin coaxial. While most do have Category 5, 33% still have Category 3 — and there is overlap. An estimated 33% of Category 5 organizations also have Category 3.

However, my concern is that the publicity surrounding high-speed LANs over Category 3 may actually lead networking professionals who have not installed Category 5 to believe that they don't need to. After all, why go through the expense and disruption of a wiring upgrade if high-speed technology can run over Category 3?

For the small group of users who still have Category 3 and want high-speed LANs, this is understandably enticing. But aside from the obvious technical risks (like near-end cross talk, for example), 155M bit/sec ATM and fast Ethernet over Category 3 face the same problems they do over Category 5. As many early users of ATM over Category 5 can attest, a Category 5 installation does not always meet specifications. The result is that network professionals begin deployment only to find their network cabling is causing cross talk.

And I promise you, this problem isn't specific to Category 5 — it will apply to Category 3.

If you choose to install high-speed LANs over Category 3, you will need to conduct extensive cable testing first, and should be sure to consider distance limitations and proximity to electrical equipment before parting with your dollars. Networking vendors that support ATM or fast Ethernet over Category 3, in addition to fiber and Category 5, are simply making sure their products are flexible and their salespeople won't be stumped by a media-related objection. These are clearly rational reasons.

But networking vendors that are actively promoting ATM and fast Ethernet over Category 3 because they believe this represents a big market opportunity are deluding themselves. And those that encourage you to delay Category 5 or fiber installations are doing you a disservice.

Korostoff is president of Sage Research, Inc. in Natick, Mass. She can be reached at (508) 655-5400. The data cited in this article is from Sage's recently published report, "Network Cabling Today & Tomorrow: A Quantitative Analysis."

IN-BOX

Ordering via the Internet

I've been following Mark Gibbs' articles for sometime now. His satellite conference "Doing Business on the Internet" a few months ago really helped me make the decision to start my own company to provide Internet access. I am excited that everywhere you look the Internet is being crammed down your throat.

The thought of purchasing items over the Internet never really scared me, so I tried to order a delicious-looking box of chocolates from Godiva Chocolatier, Inc. But I never received them. Godiva confirmed they never received the order and said they were hearing the same story over and over.

I was shocked that the all-powerful Internet had let me down. The Internet is supposed to be redefining how we do business. Isn't that a scary thought?

Then, one day, I was surfing on our office's 10M bit/sec connection (the only way to go) and ran across some delectable-looking steaks from Omaha Steaks International. Three days later, I was barbecuing several filets while enjoying a fine bottle of vino purchased through Virtual Vineyards.

What's this world coming to? I now have employees E-mailing in sick. What's next?

John Martis
General manager
American Digital Network, Inc.
San Diego

The fall of IS

The information systems (IS) departments of today are fighting a losing battle.

The reduction of centralized services on our networks is creating more single points of failure than ever before. With hardware components, it's not "if" it's going to break, it's simply a matter of "when."

Software management and control is becoming increasingly difficult as net managers try to synchronize across multiple servers. The cookie-cutting approach only works as well as net managers who take the time to create and adhere to standards.

The problem is not only the downsizing and massive changes occurring in the industry, but also the inability of IS groups to properly plan, implement and support the snowballing of technology. IS in many, if not all, cases cannot stop to provide an elegant information systems environment.

Two service companies I recently called — a bank and a mail-order clothing store, both widely recognized in their respective industries — were not able to process my requests because, they said, "the computer system is down."

Why can't you plug your computer into the wall and have it work just as you install a TV? Do you have to buy a certain brand of toaster to make wheat bread toast? Even putting gasoline in your car is much easier without having to worry about standardizing on a particular vendor.

Will it ever get that easy? Will we do our jobs so well that we're rewarded for being able to throw away our pagers? Until then, job availability in our fields will continue to rise in proportion to users.

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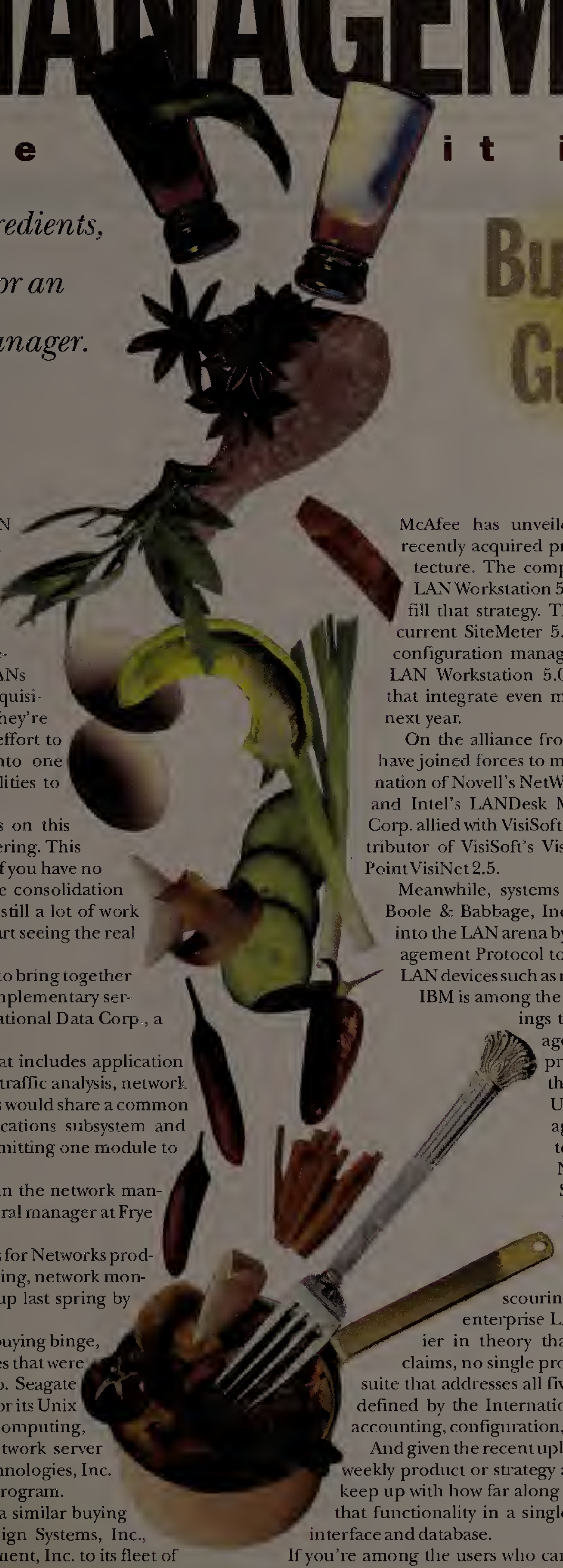
LAN MANAGEMENT:

How suite it isn't

Vendors are busily mixing ingredients, but none yet has the recipe for an integrated enterprise LAN manager.

Buyer's Guide

By Mark Miller



PIERRE PAUL PARISEAU

You may be hankering for a fresh LAN management application suite, but hold your horses — the market is in consolidation overdrive, so now may not be the best time to act on the buying urge.

As vendors scurry to meet your demand for mainframe-like systems management capabilities in products that govern LANs across the enterprise, they've gone into acquisition mode and formed a series of alliances. They're also recrafting existing offerings, all in an effort to stuff a mix of single-function products into one application suite or extend existing capabilities to new areas.

A number of vendors have made progress on this front, although none yet has a soup-to-nuts offering. This means you won't be completely out in the cold if you have no other choice but to buy today. But with all the consolidation among companies and product lines, there is still a lot of work ahead. It'll probably be mid-1996 before you start seeing the real fruits of that labor.

"The consolidation reflects vendors' efforts to bring together independent tools into integrated suites of complementary services," says Richard Villars, analyst with International Data Corp., a market research firm in Framingham, Mass.

The idea is to create an integrated suite that includes application tasks such as hardware and software inventory, traffic analysis, network configuration and alarm tracking. The modules would share a common graphical user interface, database, communications subsystem and interprocess communications mechanism, permitting one module to cross-trigger actions in other modules.

"Consolidation has become the way of life in the network management space this year," says Tom Yerkes, general manager at Frye Computer Systems, Inc. in Boston.

Yerkes should know. Frye and its Frye Utilities for Networks product, which includes software distribution, metering, network monitoring and inventory functions, was gobbled up last spring by Seagate Software Co. of Scotts Valley, Calif.

Seagate is one of the vendors that went on a buying binge, feeding on competitors that could provide pieces that were missing from its overall management portfolio. Seagate also bought NetLabs, Inc. of Cupertino, Calif., for its Unix network management capabilities, Network Computing, Inc. of Cupertino, Calif., for its LANAlert network server monitoring utility and Creative Interactive Technologies, Inc. of Durham, N.C., for its Ashwin job scheduling program.

McAfee, of Santa Clara, Calif., has been on a similar buying spree, adding products from Automated Design Systems, Inc., Saber Software Corp. and Brightwork Development, Inc. to its fleet of virus scanners and other security products.

McAfee has unveiled a strategy for melding its recently acquired products under a common architecture. The company released last month Saber LAN Workstation 5.5, among its first attempts to fulfill that strategy. The product combines McAfee's current SiteMeter 5.1 and SiteExpress 3.0 with the configuration management features found in Saber LAN Workstation 5.0. McAfee says further releases that integrate even more functionality are due early next year.

On the alliance front, Novell, Inc. and Intel Corp. have joined forces to market ManageWise 2.0, a combination of Novell's NetWare Management System (NMS) and Intel's LANDesk Management Suite 2.01. Unisys Corp. allied with VisiSoft, Inc. to become the exclusive distributor of VisiSoft's VisiNet, which Unisys calls Single Point VisiNet 2.5.

Meanwhile, systems management vendors such as Boole & Babbage, Inc. are extending their products into the LAN arena by using the Simple Network Management Protocol to collect status information from LAN devices such as routers and servers.

IBM is among the vendors busily retrofitting offerings to address enterprise LAN management. The company has made progress on this front by bringing the operation of its LAN Manager Utilities and LAN Network Manager under the direction of SystemView for AIX, formally NetView for AIX, and a retooled SystemView for OS/2 product announced just two weeks ago.

Wishful shopping

With all that's going on today, scouring the market for the perfect enterprise LAN management product is easier in theory than in practice. Despite vendor claims, no single product yet offers a fully integrated suite that addresses all five of the management functions defined by the International Standards Organization — accounting, configuration, fault, performance and security.

And given the recent upheaval in the market and the near weekly product or strategy announcements, it is difficult to keep up with how far along each vendor is in integrating all that functionality in a single product with a common user interface and database.

If you're among the users who can't put off a purchase, there are

Continued on page 46

Continued from page 45

some key criteria that can make the selection process less painful. One of the most obvious yet important is to examine the network operating system (NOS) that each management package supports.

Unisys' Single Point VisiNet 2.5 and Symantec Corp.'s Norton Administrator for Networks 2.0 manage nearly every NOS from a Microsoft Corp. Windows-based workstation. Symantec's offering can manage Banyan Systems, Inc. VINES, Novell NetWare, Microsoft LAN Manager and Windows NT Server, IBM LAN Server and Digital Equipment Corp. Pathworks networks. Unisys supports NetWare, LAN Manager, Windows NT Server, LAN Server, TCP/IP-based VINES and NETBIOS nets such as Artisoft, Inc.'s LANtastic.

Some offerings run in NOS-independent or -specific environments. For example, Frye's NetWare Early Warning System monitors critical statistics for NetWare servers only. But Frye's Software Update and Distribution System module is NOS-independent, supporting NetWare, VINES, LAN Manager and LAN Server, AT&T StarLAN, Pathworks and more.

Other products, such as Microsoft's Systems Management Server (SMS) 1.1, can gather data from a NetWare or Windows NT Server, but it must run on a Windows NT 3.5 Server-based machine. Novell's ManageWise and McAfee's offerings are even more restrictive, as these products manage NetWare environments only.

More importantly, you've got to look at the strong suit of each existing product to make sure it will satisfy your most burning needs. In making this examination, keep a close watch for how each product you look at will

Enterprise LAN management

Company	Product	Console		Mgmt. protocols	Managed devices	Accounting management				Configuration management					Fault management				Performance management					Security management				Price
		Stand-alone workstation	Management platform			Electronic software distribution	Inventory tracking	Software license metering	Software version tracking	Autodiscovery/mapping	Automatic net reconfiguration	Moves, adds and changes tracking	Network design optimization	Node configuration change tracking	Alarm/alert notification	Alarm correlation	Disaster recovery	Remote node reconfiguration	Capacity planning	Event scheduling	Protocol analysis	Remote monitoring	Trouble-ticketing	Data storage backup	Off-hour access logging	Password usage tracking	Password violation logging	C = Per client S = Per server U = Per user/No. of users
AXON Networks, Inc. (617) 630-9600	LANServant Manager and Probes	✔	✔	RMON, SNMPv1	Internetwork										✔						✔	✔						U: $2,500-$5,000/1-10
	Traffix Manager and Flexi Probe 6000	✔	✔	RMON, SNMPv1	Internetwork								✔		✔				✔			✔						U: $8,000-$12,500/1-10
Banyan Systems, Inc. (800) 222-6926	OutLook 1.1 for HP OpenView		✔	SNMPv1, SNMPv2	Internetwork, NOS, workstation					✔	✔	✔		✔	✔	✔		✔				✔	✔		✔			C: $1,995
Bay Networks, Inc. (800) 822-9638	Optivity		✔	RMON, SNMPv1	Internetwork		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔		✔	S: $3,495-$13,995
Boole & Babbage, Inc. (800) 544-2152	Command/Post	✔		SNMPv1	Internetwork, NOS, workstation										✔	✔	✔	✔		✔		✔	✔	✔	✔	✔	✔	C: $1,500-$6,000 S: $70,000 (1)
Bull HN Information Systems, Inc.'s ISM Division (508) 294-6595	OpenMaster	✔		RMON, SNMPv1	Internetwork, NOS, workstation	✔	✔		✔	✔	✔	✔		✔	✔	✔		✔	✔	✔		✔	✔	✔	✔	✔	✔	U: $125-$26,250/1-10
Cabletron Systems, Inc. (603) 332-9400	Spectrum/Blue Vision 2.0		✔	RMON, SNMPv1	Internetwork, NOS, workstation	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	C: $5,000 S: $10,000
	Spectrum Enterprise Manager 3.1	✔		RMON, SNMPv1	Internetwork, NOS, workstation	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	C: $5,000 S: $10,000
Cisco Systems, Inc. (800) 553-6387	CiscoWorks		✔	RMON, SNMPv1, SNMPv2, DMI	Internetwork, NOS, workstation	✔	✔		✔	✔	✔	✔		✔	✔		✔	✔	✔	✔	✔	✔				✔	✔	S: $2,495-$9,995
Digital Equipment Corp. (800) 344-4825	Polycenter Management Solution for Digital Unix		✔	RMON, SNMPv1, DMI	Internetwork, NOS, workstation	✔	✔			✔		✔			✔	✔			✔		✔	✔		✔	✔	✔	✔	C: $100-$500 S: $15,000-$100,000
	Polycenter Management Solution for Windows NT		✔	RMON, SNMPv1, DMI	Internetwork, NOS, workstation	✔	✔	✔	✔	✔		✔			✔													C: $25-$300 S: $7,000-$15,000
Frye Computer Systems, Inc., a Seagate Software Co. (800) 234-3793	The Frye Utilities for Networks	✔		DMI	Internetwork, NOS, workstation	✔	✔	✔	✔		✔	✔		✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	S: $249-$5,219
Hewlett-Packard Co. (800) 533-1333	Interconnect Manager/OpenView Windows Bundle		✔	SNMPv1	Internetwork, workstation					✔	✔				✔							✔			✔			U: $2,829/1
	OpenView Interconnect and Router Manager/UX		✔	SNMPv1	Internetwork, NOS, workstation					✔					✔					✔		✔					✔	U: $19,999/1
IBM (800) 426-2255	SystemView for AIX	✔	✔	RMON, SNMPv1, SNMPv2, DMI	NOS, workstation	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	C: $100-$3,000 S: $5,000-$34,000
Intel Corp. (800) 538-3373	LANDesk Management Suite 2.01		✔	SNMPv1, DMI	NOS, workstation	✔	✔	✔				✔		✔	✔					✔	✔	✔						U: $5,000- $40,000/ 100-1,000 (2)
McAfee (408) 988-3832	Saber LAN Workstation 5.5	✔		NA	NOS, workstation	✔	✔	✔						✔	✔	✔	✔	✔		✔		✔						C: $40-$72 (2)
Microsoft Corp. (206) 882-8080	Systems Management Server 1.1		✔	DMI	NOS, workstation	✔	✔	✔							✔			✔		✔	✔	✔						C: $3,495-$5,495 S: $649
Network General Corp. (800) 764-3337	Distributed Sniffer System		✔	SNMPv1, SNMPv2	NOS					✔			✔	✔	✔	✔			✔	✔	✔	✔						C: $3,995-$4,995 S: $7,495-$20,495
	Expert Sniffer Network Analyzer	✔		SNMPv1, SNMPv2	NOS					✔			✔	✔	✔	✔			✔	✔	✔							U: $4,995-$27,000/1
Newbridge Networks, Inc. (800) 368-4843	VIVID System Manager	✔	✔	SNMPv1, SNMPv2	Internetwork, workstation	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔			✔		S: $10,000
Novell, Inc. (800) 453-1267	ManageWise 2.0	✔		RMON, SNMPv1	Internetwork, NOS, workstation	✔	✔	✔	✔	✔		✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	S: $795-$12,995
Plexcom, Inc. (800) 753-9526	PlexView for Windows	✔		RMON, SNMPv1	Internetwork, NOS, workstation		✔			✔	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔			✔		✔	U: $995/1
Racal-Datacom, Inc. (800) 722-2555	CMS Management for HP OpenView		✔	RMON, SNMPv1	Internetwork		✔		✔	✔		✔					✔	✔	✔			✔		✔	✔	✔	✔	U: $4,000-$20,000/4-20
	CMS Management for IBM NetView/AIX		✔	RMON, SNMPv1	Internetwork		✔		✔	✔		✔			✔	✔	✔	✔	✔			✔		✔	✔	✔	✔	U: $4,000-$20,000/4-20
	CMS 6000 Integrated Network Management System	✔		RMON, SNMPv1	Internetwork		✔		✔			✔			✔	✔	✔	✔	✔			✔		✔	✔	✔	✔	U: $4,000-$20,000/4-20
SunSoft, Inc. (800) 786-7638	Solstice Domain Manager	✔		SNMPv1, SNMPv2, DMI	Internetwork, NOS, workstation					✔					✔	✔		✔	✔	✔	✔	✔	✔	✔	✔			U: $995-$9,995/1
Symantec Corp. (800) 441-7234	Norton Administrator for Networks 2.0	✔	✔	NA	NOS, workstation	✔	✔	✔				✔		✔										✔				U: $500-$37,000/ 10-1,000 (2)
3Com Corp. (408) 764-5000	Transcend Enterprise Manager	✔	✔	RMON, SNMPv1	Internetwork, workstation										✔			✔				✔					✔	U: $3,495-$9,495/1
Unisys Corp. (800) 874-8647, Ext. 579	Single Point VisiNet 2.5	✔		SNMPv1	Internetwork, NOS, workstation		✔			✔					✔							✔	✔					S: $799-$1,995

Products highlighted in color were selected for the Short List.

Chart compiled by Kathy Scott

Footnotes:

(1) Cost per managed server or element management system is $1,500-$12,000.

(2) Pricing is per managed node.

NA = Not applicable

change over time.

Single Point VisiNet currently has strong inventory, configuration and problem/event management, but it lacks utilities for traffic measurement.

ManageWise provides configuration, performance and net utilization information using the Remote Monitoring (RMON) standard, and can be incorporated into a SystemView for AIX, Hewlett-Packard Co. OpenView or SunSoft, Inc. SunNet Manager console. But remember that ManageWise can only manage NetWare environments.

Some suites, such as Norton Administrator for Networks, ManageWise and Single Point VisiNet are designed to handle WAN connections. Each of these products incorporates a distributed database or RMON functionality.

Distributed database or monitoring obviates the need to replicate management functions at each site. A distributed database stores management details at each remote location and forwards the critical data back to headquarters.

As an extension to SNMP, RMON requires the use of management agents, called remote probes, at critical locations throughout the internetwork. These probes gather key network statistics and historical information, and report a subset of those details to the central management console.

Cisco Systems, Inc. will be using RMON technology in its CiscoWorks product, originally designed to manage Cisco routers, to manage LANs down to the network interface card level. Cisco will employ RMON data to extrapolate application-level traffic moving to and from clients and servers, marrying this data with traffic information from the routers and switches in the net. Cisco says you'll be able to see which applications are becoming bandwidth hogs and understand network-based performance characteristics.

Then you've got to consider how well a package tracks critical data about the LAN, such as inventory information that can be used to determine when software upgrades are needed. Norton Administrator for Networks keeps track of more than 2,500 items of information about what is running on the LAN and the desktops attached to it. But the package lacks network monitoring capabilities.

The database management system that stores all of the net management details is also significant. Make sure you understand the architecture of that DBMS and the amount of processing power it consumes.

Microsoft's SMS uses SQL Server as its DBMS, which yields extensive querying capabilities but comes at the price of consuming a large amount of management console resources.

In contrast, Norton Administrator for Networks uses a proprietary database but lets its information be exported to other DBMSs using Microsoft's Open Database Connectivity. Many other products, including Frye Utilities for Networks, ManageWise and SMS allow data to be exported as comma-delimited files.

Standards skinny

Another issue is the integration of a LAN management tool set with a standards-based enterprise management platform. If this area is one of your requirements, look for the product you select to support the Desktop Management Task Force's (DMTF) Desktop Management Interface (DMI), SNMP or both.

DMI establishes a set of common APIs that make it possible for management programs to exchange data with desktop workstations. The Component Interface runs on desktop systems and communicates with the Management Interface running on the LAN management package. There is also a Management Information Format database where data about desktop devices is stored.

DMTF members include such heavyweights as Apple Computer, Inc., Compaq Computer Corp., Digital, HP, IBM, Intel, Microsoft, Novell and SunSoft. But only a handful of vendors claim to be DMI-compliant. Of those listed in the chart on page

Continued on page 48

Buying tips

Make sure the products you examine have a DBMS for storing vital information and mechanisms for generating a variety of reports.

DBMS support

- ▶ Most of the companies listed in the Buyer's Guide chart on page 46 bundle their products with either a proprietary or third-party DBMS. The exceptions are Cabletron (Spectrum/Blue Vision 2.0 only), Microsoft and SunSoft; all charge extra for a DBMS.

Report generators

- ▶ Most vendors offer report generators that let you create reports on the fly, sort data according to your needs, and display reports graphically and numerically. The following companies are missing at least one of these capabilities: Racal-Datacom, Symantec and 3Com. The Unisys product has no report generator capability.

NetworkWorld Short LIST

Enterprise LAN management products

The Short List highlights products Network World *recommends you examine closely when evaluating enterprise LAN management offerings. Packages named to this Short List provide functions across multiple management areas, support enterprise environments, and utilize a common user interface, data repository and interprocess communications.*

Frye Computer Systems, Inc., a unit of Seagate Software Co., has a strong product in **The Frye Utilities for Networks**, which has nine modules that can be combined into a customized suite or run stand-alone. These modules include the LAN Directory, which inventories more than 700 hardware and software items, as well as generates 20 standard reports; Software Update and Distribution Service (SUDS) and SUDS Wide Area Network Distribution for electronic software distribution; Software Metering and Resource Tracking to monitor and control software on the network; and the NetWare Early Warning System that monitors more than 75 critical Novell, Inc. NetWare maintenance statistics.

Novell and **Intel Corp.** win a joint prize for **ManageWise 2.0**, a combination of Novell's NetWare Management System and Intel's LANDesk Management Suite 2.01. Supplied as a set of NetWare Loadable Modules and desktop agents for managing NetWare 3.1 or 4.X nets, ManageWise has extensive SNMP and remote monitoring capabilities, and can be integrated with Hewlett-Packard Co. OpenView, IBM SystemView for AIX, and SunSoft, Inc. SunNet Manager consoles. Key abilities are in its server management, including long-term trend analysis. Traffic monitoring is also included. Further, ManageWise can run approximately 100 third-party provided applications.

Symantec Corp.'s Norton Administrator for Networks 2.0 is a good way to manage a variety of desktop environments, including DOS, Windows, OS/2 and Macintosh, from a single Windows-based console. The product is architected to manage multiple remote sites from a central location and supports software distribution, data throttling and software metering across WAN links. Workstation inventory, software metering and reporting functions are especially strong. Add-on modules include AntiVirus, AntiVirus for NetWare, Utilities Administrator for workstation monitoring and recovery, DiskLock Administrator for workstation access control, pcAnywhere for remote help desk support, and Enterprise Backup.

Unisys Corp.'s Single Point VisiNet 2.5 is one of the most tightly integrated packages out there today. Designed by VisiSoft, Inc. and now exclusively marketed by Unisys, the product's strong suit is its ability to provide an integrated view of network topology, configuration, assets, events and alarms with error logs. Another strength is its visual interface, which allows successively detailed maps of LAN and WAN segments, as well as the ability to view workstation configuration and printer queues.

The net management product speedway

With the rules of the net management road changing faster than the lights at a busy intersection, there is growing overlap among various product classes.

Here's a rundown of what's going on within each class of management product.

Open management platforms

These products include Hewlett-Packard Co.'s OpenView, IBM's SystemView and SunSoft, Inc.'s SunNet Manager. The platforms provide mechanisms for building detailed configuration maps, detecting faults and tracking problems in multivendor enterprise nets.

Platforms can also pull information from a mix of internetwork equipment and LAN management applications into a central database. They rely on the applications that run on top of them for LAN management capabilities.

Platform-based applications

These are the programs that run on top of a platform and typically manage a specific vendor's equipment. While such applications can "see" what is happening on LAN servers, they fall short when it comes to performing even the most routine server administration functions.

Network operating system (NOS) vendors are playing in this segment of the market, too. Banyan Systems, Inc.'s OutLook 1.1 for HP OpenView, for example, can perform Banyan VINES administration functions as well as check LAN operational status.

LAN management suites

NOS and third-party LAN management utility vendors are sewing up a mix of functions from once separate offerings to produce this class of product. The suites share a common user interface, database and interprocess communications facilities that make it possible for one module, such as a fault monitor, to kick off a process in another module, such as a trouble tracker.

A few NOS vendors, including Novell, Inc. and Microsoft Corp., are coming up with platforms of their own to run these suites.

A number of these LAN management suites are using the Simple Network Management Protocol to ascertain the status of internetworking devices but can't quite do more than that yet.

Single-function LAN utilities

These are network monitoring, virus detection or software metering tools for LAN environments. While they may excel in their area of expertise, they have several downsides, such as different user interfaces, operating characteristics and learning curves.

These single-function products normally end up running on the same central management console, which is what has led many users to demand that they become part of integrated suites.

By Mark Miller

Continued from page 47

46, Cisco, Digital, Frye, IBM, Intel and SunSoft say they support DMI.

Microsoft recently won DMTF support for creating an alternative DMI specification. This development will force LAN management vendors to support two implementations of the DMI — one to manage Microsoft systems and one to manage other vendors' systems (*NW,* Oct. 9, page 24).

SNMP has much wider support. SNMP is used to pass management data from just about any net device to a management workstation. Only those vendors with a heavy history in LAN inventory and assets management — Frye, McAfee and Symantec — do not yet support SNMP.

Vendor claims of standards compliance and demonstrated interoperability are two different issues, says Tim Wilson, senior consultant at Decisys, Inc., a Sterling, Va., net consulting firm.

"Users aren't concerned about Microsoft and Novell's battle for market share; they want the management data to be correlated, regardless of what systems and networks they are using," Wilson says. "If they choose to use SMS for software distribution, ManageWise for LAN management and McAfee software for security, they expect all of those applications to work together."

Wilson advises you to make vendors show how their applications work together, rather than take their word for it. Addressing multifaceted problems is clearly not as easy as it used to be, and asking for an interoperability demonstration will pinpoint a product's limitations.

"LAN administrators today must be able to track network performance, systems and application information, security data and other management information," Wilson says. "Often, that information must then be passed up to a central site. In short, LAN administration functions are becoming more consolidated. You can't just pull up a copy of Norton Utilities and fix the problem as you did with stand-alone PCs."

What's in store

While vendors are attacking the enterprise LAN management problem from different fronts, it seems the emerging LAN management suites have a lead. These products will be able to track LAN activity and use standards such as the DMI and SNMP to pass information off to higher level managers. At the same time, the higher level managers continue to work to bring LAN management functionality into their products.

"With the increasing amount of critical processing being relegated to net servers, additional capabilities for monitoring server power and operating temperature, plus remote reconfiguration and rebooting functions are becoming new requirements," says Neil Ross, product marketing manager at Unisys.

Ross says the next release of Single Point VisiNet, slated for December, will include server temperature and voltage monitoring via a Unisys-designed add-on card.

Should one of the environmental measurements exceed customer-defined limits, an alarm will be generated and sent to the management console, where an error log entry will be made and a trouble ticket opened.

Other areas where vendors need to deliver more functions include server administration and ties with net applications such as electronic mail and Lotus Development Corp.'s Notes. These functions, however, fall under the systems management arena, which many feel goes a step beyond where LAN management products are today.

"LAN managers face challenges not faced by their mainframe counterparts a decade ago, such as multiple vendors and geographically distributed network resources," says Jack Brown, director of distributed systems management products at Boole & Babbage. "But with client/server applications moving off the mainframe and onto the local net, LAN managers are looking to the glass house — with its expertise in systems management — for assistance."

As you toil with the challenge of supporting increased user demand with decreasing resources, watch closely over the next few months to see how enterprise LAN management vendors deliver on promises of highly integrated products.

If you can't wait to see how things shake out, you'll just have to prioritize what's most important and shoot for the product that scores best in that area.

But whatever you do, grill your vendor on what changes are coming, because the picture will change in months ahead.

Miller is a contributing editor and president of DigiNet Corp., a Denver-based data communications engineering company. He has authored seven books on LAN and WAN technologies, and is currently leading Network World*'s two-day seminar titled Internetworking: Designing LANs, WANs and Broadband Networks. Miller can be reached via the Internet at mark@diginet.com.*

A litmus test

Here's a good way to make sure vendors can meet claims of providing an integrated LAN management suite.

Think of a couple typical scenarios you've faced in the past or expect to face in the future. Ask each vendor you evaluate to show you how its product would work in each scenario.

Or, try the following scenarios and make sure the vendor responds with something that closely matches what is shown in the graphic.

Scenario 1: You've got to distribute new versions of Windows 95, which will require a check of workstation processor type, RAM and hard-disk storage availability.

What should happen: An inventory tracking module determines which workstations are presently ready for the upgrade and flags those that need additional hardware or memory.

Data is then passed to a planning module, which schedules the upgrades, and an accounting module, which calculates the total upgrade cost.

Scenario 2: A help desk operator needs to check on a workstation driver after a user complains of a problem.

What should happen: A query of the common database would reveal the identity of all machines with the same drivers, schedule them for upgrades, distribute the new drivers and update the database — without involving the users who had not yet complained. Collaboration between the inventory and software distribution tools would make such a scenario possible.

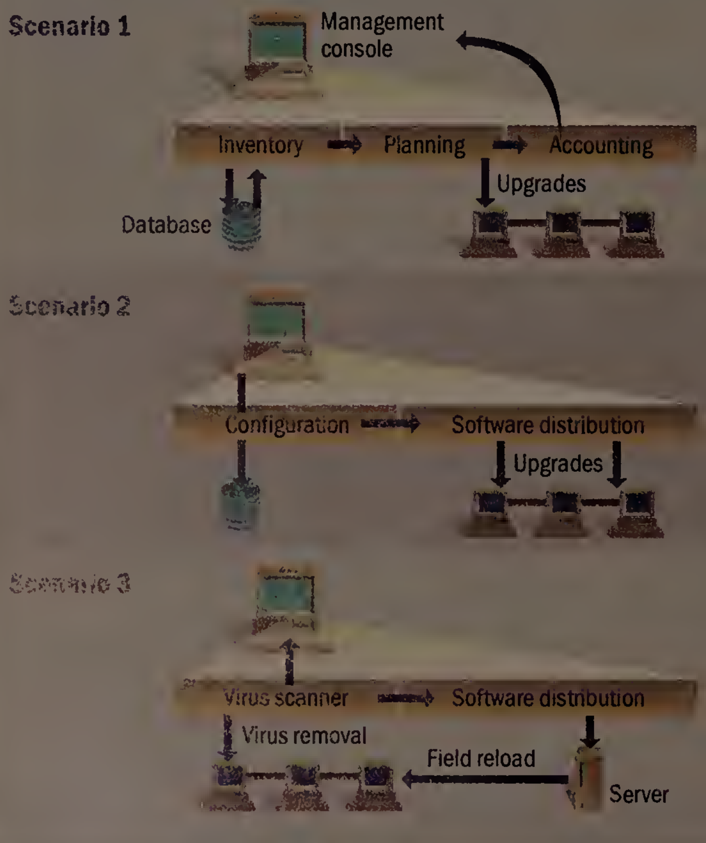
Scenario 3: You need to eradicate a virus detected by a virus scanner.

What should happen: An integrated suite would scrub the infected file, alert the administrator, encapsulate and send that file to a secured location on the host, thereby preventing any further damage. It would then reload the affected workstation with a clean copy of the file from a network server.

By Mark Miller

SCENARIOS MANAGED

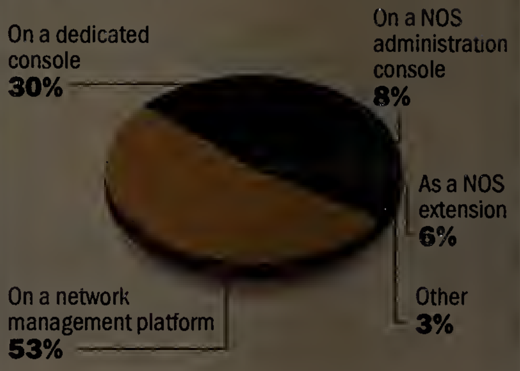
Here is what should happen in each of the described scenarios.



Reader views on enterprise LAN management

Based on 100 interviews.

Where do/will you run an enterprise LAN management suite?



Key product requirements
(Highest score of 5)

Common database shared by all applications	4.15
Common user interface	4.12
Report generator	3.97
Automation routines	3.94
Link to stand-alone SNMP management console	3.75

Most important management application
(Highest score of 5)

Fault	3.69
Performance	3.42
Security	3.20
Configuration	3.19
Accounting	1.50

Focus Data, an independent market research firm in Framingham, Mass., conducted this survey. Focus Data specializes in gathering primary data from end-user organizations regarding their enterprise network environment and needs. For more information about Focus Data services, send E-mail via the Internet to mdabbon@focusdata.ultranet.com or call Mona Dabbon at (508) 626-2556.

MORE ON-LINE

You'll find more information on Network World Fusion about which internetworking devices, network operating systems and workstations each product listed in the Buyer's Guide chart on page 46 can manage. Visit http://www.nwfusion.com, select NetRef then Buyer's Guides.

While you're there, also look for links to *Network World* stories about recent developments in and tests of LAN management products.

Gateways to the WORLD

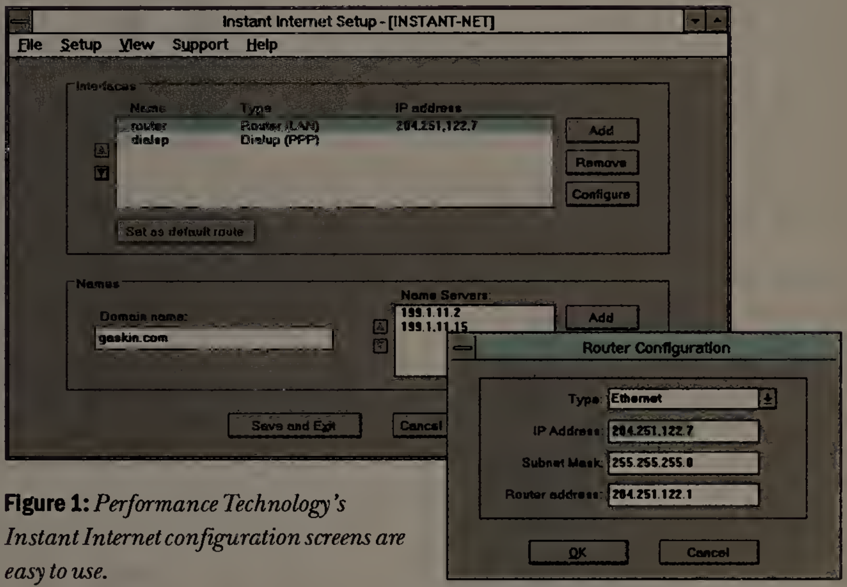
Roam the Internet from your desktop with the help of one of these gateways that sit next to your NetWare server.

By James Gaskin

While many organizations need Internet access from their NetWare networks, some are nervous about running the kinds of server-based gateways we looked at earlier this month (*NW,* Nov. 6, page 49) or, indeed, any nonessential server-based software, for fear of a crash. Others find file and print services too critical to give up a single server CPU cycle. Luckily, there's a wide selection of NetWare-to-Internet gateways running on stand-alone systems, Windows NT workstations or servers, OS/2 Warp workstations and various versions of Unix.

If numbers mean anything, there are more NetWare-to-Internet gateways that do not run on a NetWare server than do. Two of the products we reviewed earlier — Inetix from Micro Computer Systems, Inc. (MCS) and Passport from Internet Junction, Inc., a division of Cisco Systems, Inc. — have versions for Windows NT and Unix servers.

Two other products — Instant Internet from Performance Technology, Inc. and LANlink from The Internet Connection, a division of FEL Industries, Inc. — are stand-alone gateways that include all necessary hardware and software for connecting IPX nets to the Internet. BateTech Software, Inc. is attempting to enter the market with Iway-One, a Windows NT-based product. And one of the earliest TCP/IP gateway products, Catipult from Ipswitch, Inc., is still running on OS/2.



Name	Type	IP address
router	Router (LAN)	204.251.122.7
dialup	Dialup (PPP)	

Domain name: gaskin.com

Name Servers: 199.1.11.2
199.1.11.15

Type: Ethernet

IP Address: 204.251.122.7

Subnet Mask: 255.255.255.0

Router address: 204.251.122.1

Figure 1: *Performance Technology's Instant Internet configuration screens are easy to use.*

For all-in-one convenience, a Unix server makes an excellent gateway. Not only can the server run the gateway software, but it can also provide firewall services, run Web server software and support scores of concurrent users. Of the products we looked at, both Inetix and Passport run on various Unix platforms, but the current big gun in the market is Sun Microsystems, Inc.'s Netra, which runs Passport gateway software on the company's existing Internet router hardware. Since Netra's software and Passport are the same, we did not review Netra separately.

Each product appeals to different users. Turnkey systems plop onto your network quickly and easily, and don't require you to learn a new operating system. The Internet Connection's LANlink covers the low-price market. Performance Technology's Instant Internet is adding more management features. MCS and

Continued on page 52

NetResults

Product	**Iway-One**	**Passport**	**LANlink**	**Catipult**	**Inetix**	**Instant Internet**
Vendor	BateTech Software, Inc. (303) 763-8333	Internet Junction, Inc. (415) 934-3600	The Internet Connection (800) 639-4110 (802) 348-7171	Ipswitch, Inc. (617) 676-5700	Micro Computer Systems, Inc. (214) 659-1514	Performance Technology Inc. (800) 784-4638 (210) 979-2000
Price (concurrent users)	10 - $495 25 - $750 26 and up - $995	5 - $595 10 - $1,095 25 - $2,495 50 - $4,495 100 - $6,995	Dual Ethernet adapters - $2,595 (all options support 50 concurrent users) NETmaster client software suite per user - $45	15 - $1,975 25 - $2,975 40 - $4,375 50 - $5,675	5 - $995 25 - $1,995 50 - $2,995 51 up to host's limit - $4,995	All systems support 50 users Dial-up 28.8 modem - $3,495 Dual Ethernet adapters - $3,745 ISDN for NetWare - $4,495
Key points	▶ Tested in beta only ▶ Recommends Windows NT server for more than 10 users ▶ Uses Microsoft Access for client control and logging	▶ Runs on multiple server platforms ▶ Includes shareware FTP and telnet software ▶ Optional SuperHighway applications available from Frontier	▶ Lowest cost hardware gateway ▶ True "black-box" low-maintenance gateway ▶ Excellent software suite available ▶ No IP filtering or client control features	▶ Only OS/2 gateway ▶ Requires NETBIOS on each client ▶ Complete application suite included ▶ Strong Unix flavor for administration	▶ Runs on multiple server platforms ▶ Includes FTP client application	▶ True "black-box" low-maintenance gateway ▶ Upcoming version provides excellent client access control ▶ Manageable by SNMP ▶ Load leveling between gateways

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Good point.

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Something that, you may have guessed, we're no strangers to at IBM. In fact, at the last Enterprise Management Summit, IBM surpassed all other vendors in systems and network management. On top of that, our RISC System/6000® and its UNIX operating system, AIX,® connects to a wide range of systems, including HP,® Sun,® DEC® and PC LANs, so you'll be able to keep working with your existing business computers.

RS/6000 is a leader in UNIX midrange sales.

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10/94 D.H. Brown Report "UNIX Matures" – IBM AIX 41 International Data Corporation (IDC) ranks IBM as a leader in 1994 Worldwide UNIX Midrange Systems Revenue IBM, AIX and RISC System/6000 are registered trademarks and DB2/6000 and RS/6000 are trademarks of International Business Machines Corporation. UNIX is a registered trademark in the U.S. and other countries, licensed exclusively through X/Open Company Limited All other company and/or product names are trademarks or registered trademarks of their respective companies ©1995 IBM Corporation

Continued from page 49

Internet Junction offer no-frills gateways on multiple platforms, making the choice easy for Unix fans needing basic access without fancy applications or management features. If applications are important, Frontier Technology Corp.'s CyberJunction adds a full suite of popular Internet applications to Passport, just as Catipult adds similar applications to an OS/2 system. Sun customers can allow their NetWare clients access to the Internet through their Netra box, which in larger configurations can easily handle up to 250 concurrent gateway users.

One gateway, different platform

The technical details for NetWare-to-Internet gateways running on non-NetWare servers are the same as for those running on NetWare servers. WinSock, in the form of the WINSOCK.DLL program, is still the enabling technology for these gateways. Each gateway vendor provides its own WINSOCK.DLL program that lets clients communicate with the corresponding WinSock software on the gateway. In the gateway, IPX packets are transferred to TCP/IP for routing to the Internet. On the return trip, answering packets are transferred back to IPX and routed to the originating station.

When a gateway is running on a NetWare server, the IPX protocol is readily available. Running it on a different platform makes IPX support an issue. IPX is not the native transport of all the gateways we looked at. In these cases, IPX is usually supplied by the gateway vendor, although Novell, Inc. provides IPX protocols when you buy UnixWare, and Microsoft Corp. provides IPX with Windows NT.

All the tested IPX protocols worked fine, although we sometimes had to take extra steps during installation to add or configure IPX.

Turnkey time

LANlink from The Internet Connection and Instant Internet from Performance Technology offer a black-box approach to Internet gateways. Both are self-contained systems based on a PC platform that operate without a keyboard or monitor. If you like the idea of not burdening your NetWare server but don't care to start supporting another operating system such as Windows NT, OS/2 or Unix, these turnkey systems are a good option.

LANlink stores everything on a diskette drive, while a read-only memory chip on the motherboard stores the Instant Internet gateway software. LANlink uses DOS, but don't worry: The company has been making gateways for Digital Equipment Corp. DECnet and TCP/IP for nearly a decade and, long ago, compensated for the inadequacies of the operating system. Instant Internet's operating system is so hidden that as far as you're concerned, there is no operating system since you never touch it.

With an internal frame relay controller, LANlink eliminates the need for a data service unit/channel service unit at your site, resulting in cost reductions.

Internet service providers configure the LANlink gateway, deliver it to you and even turn it on. You never have to touch the box; just install the necessary client software and either buy the excellent NETmaster suite of software from The Internet Connection or provide your own. You can modify the configuration files on the diskette if the Internet service provider's IP address changes, but modifications are rarely needed. Since there's no monitor or keyboard to go along with the 486 66-MHz box, it's easy to put the LANlink gateway on the shelf and forget it. If the system loses power, it reboots back to gateway operation.

LANlink includes one Ethernet card and any of the following for the Internet connection:

- A second network card for local router connection.
- A dial-up analog 28.8K bit/sec modem.
- An ISDN adapter.
- A 56K bit/sec frame relay adapter.
- A T-1 frame relay adapter.

Networks supported by LANlink include NetWare, VINES and NETBIOS-based LANs. WINSOCK.DLL and other client support programs are included, as is one copy of The Internet Connection's NETmaster application suite. NETmaster comprises registered copies of Netscape for Web browsing, QualComm, Inc.'s Eudora for E-mail, News Express shareware for newsreading, WinSock FTP for file transfers and EWAN's Telnet for terminal emulation, meeting all client software needs for an aggressive seat cost of $45.

Despite all those options, one thing LANlink fails to include is IP filtering or other ways to block client access to portions of the Internet.

Unlike LANlink, Performance Technology's Instant Internet requires users to perform setup configuration from a networked Windows workstation. Rather than expecting an Internet service provider to offer the details, Instant Internet provides information for reaching scores of providers with dial-up modem scripts.

Originally shipped with only a dial-up 28.8K bit/sec modem, Instant Internet now also offers dual-Ethernet models for use with an external router. Instant Internet supports 50 concurrent users per box, can offer load leveling between multiple boxes, and is adding extensive IP filtering and user management features in its 3.0 release, due out now. The new version also adds an internal ISDN adapter option, management by Simple Network Management Protocol, dynamic monitoring and logging features.

Network Fusion

For tips and tricks on configuring IPX on non-NetWare servers, select NetRef then Buyer's Guides and Reviews. Look for Stand-alone Internet Gateways for NetWare.

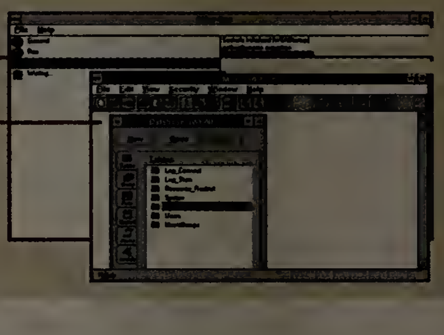
Instant Internet applications are a bit weaker than LANlink's. The ubiquitous Eudora E-mail client is included, as is the popular shareware WinVN newsreader. The Web browser is WinWeb, which is also shareware and solid but not quite up to Netscape or Mosaic standards. FTP and Telnet applications are missing but may be easily collected from your Internet service provider's FTP server. A quick setup page provides information for application setup.

The Instant Internet management programs are clean and straightforward (see Figure 1, page 49). All utilities are available under a single icon, and the management program may be password-protected. Any Windows workstation can manage all the Instant Internet gateways on your network.

CLIENT SECURITY VIA DATABASE

Figure 2

Iway-One demonstrates the first of what is likely a growing trend: databases to control access to the Internet.



In the background is a status screen. . .

. . .with Microsoft Access running the IWAYONE.MDB database to control client access in the foreground.

To support larger companies, Instant Internet now offers load leveling among multiple gateways. You may let any available gateway serve a user when the person starts an Internet application and, thereby, activates the WINSOCK.DLL program, or you may set preferred gateways and secondary gateways. This feature allows you to support a workgroup with one Instant Internet gateway while transparently using a gateway in another department as a backup.

NT-based gateways

If a stand-alone server doesn't grab you, you can turn to another server-based solution. Windows NT is well suited to the role of Internet gateway server because it has the horsepower and memory protection necessary to run a gateway. NT includes a TCP/IP protocol stack that's simple to configure, and NetWare clients can readily connect to a Windows NT box.

We looked at the first two Windows NT-based Internet gateways in our last gateways review: MCS' Inetix and Internet Junction's Passport. Passport was developed primarily for Windows NT, while MCS released its Unix and Windows NT versions of Inetix before the NetWare Loadable Module was finished. However, Inetix seems to aim its marketing more at NetWare customers than at Windows NT users.

In terms of function, there are no differences in the versions of these two products running on Windows NT rather than on NetWare or Unix, as we'll discuss shortly. In fact, the client software for both systems is exactly the same, regardless of the gateway server.

New on the scene is Iway-One from BateTech, a subsidiary of South Africa-based Workgroup Systems, that runs on any Windows NT platform. We tested the beta release without manuals. Although betting on beta is dangerous, it appears that BateTech has watched the market and is ready to up the stakes.

BateTech recommends using Windows NT Server for more than 10 concurrent users because of the database overhead — a departure from the other Windows NT systems that run their gateways on Windows NT Workstation. Rather than developing its own database to control access for network users and groups, Iway-One includes a Microsoft Access database program and two disks full of Open Database Connectivity (ODBC) drivers.

All filters and user access controls require the database to be open and running on the Windows NT box supporting the gateway (see Figure 2).

Iway-One covers both IPX and NETBIOS clients, but NETBIOS support is cleverly folded into a special WINSOCK.DLL program. This eliminates the need to load Novell's NETBIOS into DOS memory, taking RAM away from Windows.

Based on what we've seen,

Continued on page 54

Gateway conjunction

For the first time, one of the major commercial desktop TCP/IP vendors has entered the gateway market. Frontier Technologies, Inc.'s CyberJunction software includes Internet Junction, Inc.'s Passport and Frontier's SuperHighway Access for Windows software.

Just reaching the market, CyberJunction will likely have a larger retail impact than Internet Junction's Passport could hope to achieve alone.

CyberJunction pricing is slightly higher through Frontier than when buying the software from Internet Junction because of some added goodies: VT-320, tn3270, and the SuperWeb Server software bundled with larger 50- and 100-user versions. The complete application list for CyberJunction includes Frontier's popular SuperHighway Internet front end and Internet Organizer, Web browser, E-mail, newsreader, FTP client, whois, finger, Network Time, print support and remote utilities.

By James Gaskin

NetworkWorld
TECHNICAL SEMINARS

and VLANs will reshape the enterprise, and network managers need to learn more about these technologies.”
John Gallant, Editor-in-Chief, Network World

Switching and the Virtual LAN

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6. Learn about LAN Emulation as a means to interconnect LANs
7. Explore the complete scope of emerging Virtual LAN technologies. All VLANs are not the same: evaluate the tradeoffs and determine which one works for you
8. Learn about the newest developments in MPOA (Multi-protocol interconnections with ATM)
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Continued from page 52

Iway-One offers more access control and logging features than other gateways.

It controls access by the time of day per user or group, logs all connections, and tracks user activity with predesigned graphs and reports.

Will Unix run your gateway?

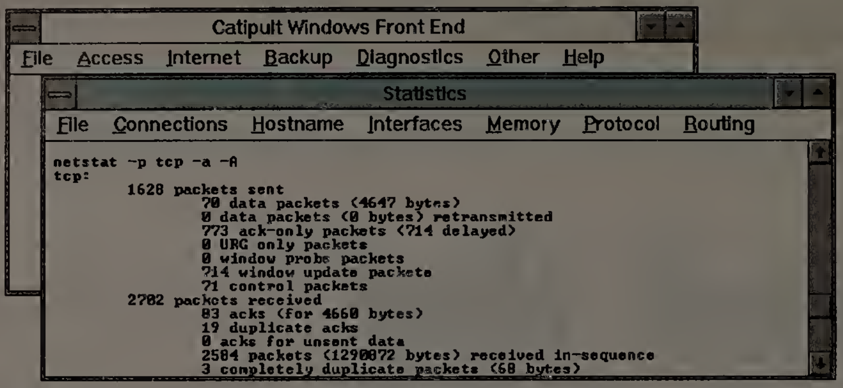
Unix is also an excellent choice for a gateway server. Unix offers good performance, memory protection, flexibility and a huge infrastructure. Nothing stops Unix systems from running the IPX protocol; third parties such as MCS have been adding IPX and NETBIOS support to Unix hosts since 1989.

Politically, however, Unix is often the last consideration for a NetWare-to-Internet gateway because NetWare users tend to shy away from Unix.

Windows NT server applications have been capturing what were in the past Unix server applications.

Since most market research firms believe Windows NT will sell more server licenses in 1996 than all Unix licenses combined, the NetWare-to-Internet gateway server door of opportunity may be swinging shut on the Unix community.

Inetix and Passport are, once again, the same lean and mean gateway products as they are on other server platforms. MCS' Inetix has the broadest Unix platform support: AIX 3.2.5 and 4.1.1, Interactive 3.2.2, AT&T/NCR SVR4 3.0, The Santa Cruz Operation, Inc. 3.2.4, Solaris 2.4 and UnixWare 2.01. Internet Junction's Passport has nonexclusive marketing arrangements with Sun for Netra, Solaris and SunOS, and a similar arrangement with Berkeley Software Design, Inc.


Catipult Windows Front End
File Access Internet Backup Diagnostics Other Help
Statistics
File Connections Hostname Interfaces Memory Protocol Routing

```
netstat -p tcp -a -A
tcp:
        1628 packets sent
                70 data packets (4647 bytes)
                0 data packets (0 bytes) retransmitted
                773 ack-only packets (714 delayed)
                0 URG only packets
                0 window probe packets
                714 window update packets
                71 control packets
        2702 packets received
                83 acks (for 4660 bytes)
                19 duplicate acks
                0 acks for unsent data
                2584 packets (1290872 bytes) received in-sequence
                3 completely duplicate packets (68 bytes)
```

Figure 3: *Although they run under Windows, most Ipswitch Catipult utilities have the look and feel of the Unix command line.*

Futures in NetWare-to-Internet gateways

All Internet gateway vendors today are testing their 32-bit clients for Windows 95 and Windows NT. The introduction of these clients is hindered by Novell, Inc.'s foot-dragging in releasing its own Windows 95 client software.

By the time you read this, most vendors will have prerelease 32-bit clients.

Support for Macintosh and OS/2 clients is not likely in the near term. Because both platforms already offer good TCP/IP solutions, there is little demand for gateway support.

Look for Internet service providers to separate into low-end dial-up providers at steadily decreasing prices and higher end network connection specialists. As more gateway vendors target Internet service providers, network customers will be offered gateways. Support costs are lower with 50 concurrent network users than with 50 dial-up users, meaning the gulf between the two types of provers will widen.

Internet Junction, Inc. is now wholly owned by Cisco Systems, Inc. How will this new arrangement affect retail sales of Internet Junction's Passport? Will Cisco use the Passport technology to get into the Internet gateway business itself?

Customers are demanding more filtering and access controls on their users connected to the Internet. Those gateways that do not support filtering will be excluded from many sales opportunities as paranoia drives companies to micromanage their employees' Internet activities.

With that in mind, two companies plan to offer greater management. Internet Junction is developing management software based on HyperText Mark-up Language. Any Web client will be able to access and manage a Passport gateway across the LAN or the Internet. BateTech Software, Inc.'s use of Microsoft Access heralds a new trend toward using existing databases for gateway access control.

Another option — one I hope is being investigated by Novell — is to use NetWare Directory Services (NDS) to manage client access control through the gateway. All typical filtering details can easily be supported by NDS. But is Novell willing to leave its 3.X customers out of the Internet gateway product to further advance NDS?

By James Gaskin

The only OS/2 option

The lone gateway still running on OS/2 is Ipswitch's Catipult (the misspelling is intentional to show the IP in the middle of the name). Ipswitch has upgraded its local Internet gateway by adding its excellent application suite.

Ipswitch adds its own TCP/IP protocol, which you would expect from one of the few vendors that sells TCP/IP for OS/2 systems. The applications are gathered under the Piper/IP and Cybersuite labels, and make a nice addition to the gateway product.

The Catipult installation switches the OS/2 Warp interface into the full-screen DOS look of a decade ago. Although it was quite a jolt for us since we're now used to graphical screens, installation proceeded without problems. There are a variety of configuration files and scripts to be edited manually, with syntax strongly reminiscent of Unix command-line products.

Right away, we hit something unexpected. OS/2 uses NETBIOS to connect the workstations to the gateway. To accommodate these connections, NetWare clients must run NETBIOS software before loading Windows. The good part of this is the support for DOS software (or DOS boxes within Windows) at the client. The bad part is the extra memory the NETBIOS and Catipult drivers take out of DOS memory space: over 40K bytes.

You must add the Catipult gateway as a NetWare user on the server storing the applications. The gateway users must be placed in a group given access to the application and to configuration directories.

TCP/IP setup required nothing out of the ordinary, but the setup process put our patience to the test. Catipult comes on 10 3 1/2-inch diskettes; at about Disk 6, I started dreaming of a CD-ROM installation disk.

We felt this installation was more involved than any other, whether it's because of the OS/2 server or the long time that Catipult's been on the market. Some of the installation routine seems as if it were written for OS/2 Version 1.3 and never upgraded. Prepare to spend some time getting things organized. At least the client software, loaded on the NetWare server, includes a program that creates a new Windows group file and loads all the Catipult icons in it when run from a workstation.

The good part of Catipult's Unix heritage is its monitoring capabilities. All your favorite Unix utilities are available in all their confusing multiswitch splendor — netstat, ifconfig, arp, fingerd, rsh, rshd, tar, tftp, tftpd, whois and more (see Figure 3). If you're a Unix neophyte, you can let these commands go untouched. If you're familiar with Unix and yearn for the command line, this is your gateway.

A basic Post Office Protocol Version 3 and Simple Mail Transfer Protocol mail server is included in the package, as are ways to execute programs on remote hosts and backup utilities. These are unusual options, but this is an unusual gateway.

As befits a stout operating system, Catipult can configure your OS/2 server to segment IPX and TCP/IP networks by adding a second network interface card. There's also instructions for connecting over PPP and SLIP, rather than through an external router.

Included applications are BateTech's IMail, INews (with advanced search abilities), three file-transfer programs, whois, ping, VT-320 and tn3270 emulation, and lpr for printing.

More utilities are hidden within other programs, such as the NSLookup program. On two separate installation disks are IMosaic, Catipult's version of Mosaic.

Everything you need is included, as are the means to monitor your network activity. However, no address filtering or Web site blocking is included.

The platform question

The big issue with gateway products today seems to be: to NT or not to NT, with Windows NT staking more claim to the NetWare application server space. For its fans, the choices are wide and varied, including minimal gateways with no applications to gateways providing full application suites.

HOW WE DID IT

The gateway server for Windows NT and OS/2 was a Gateway 2000, Inc. 75-MHz Pentium system with 32M bytes of RAM, a 540M-byte hard drive and a 3Com Corp. 3C509 Ethernet 10Base-T interface card connected to a 3Com LinkBuilder TP/8 wiring concentrator. The external router was an Ascend Communications, Inc. Pipeline 50 ISDN router connected to On-Ramp Technologies, Inc. in Dallas for the Internet connection. The primary client was an Acer Open 75-MHz Pentium system from Acer, Inc., with 24M bytes of RAM, an 820M-byte hard drive and a 3Com 3C509 Ethernet 10Base-T interface card.

Each product was tested with popular third-party Internet applications, such as Netscape. Configuration and management utilities were explored. Since the Internet is a constantly shifting environment, the speed of file transfers and the like is less of an indication of product performance than network congestion and is not listed.

BateTech's promised ODBC-driven gateway management raises the complexity level, but we'd like to try the shipping version before we give it our stamp of approval.

As one part of the market adds complexity, another strives for simplicity. The convenience of a turnkey system may appeal to those of you who are wary of fighting a new operating system. The fact that both LANlink and Instant Internet are strong turnkey products makes the turnkey systems shine just a bit brighter than most of their competition. ■

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 43.

World ALLIANCE

Gaskin is vice president of Gaskin Computer Services, a Dallas-area consulting, integration and programing firm. He is also the author of Novell's Guide to Integrating Unix and NetWare Networks, *published by Novell Press, and* The Complete Guide to NetWare 4.1, *published by Sybex. The material in this review is derived from research for Gaskin's forthcoming Prentice Hall book,* NetWare to Internet Gateways, *to be released in January. He can be reached at jgaskin@mcimail.com.*

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Briefs

■ **Amdahl Corp.** *is now offering an* **Enterprise Help Desk Consulting Service.**

Under the program, Amdahl offers nine help desk consulting services, including technology evaluations that provide approaches for change and enhancement, as well as bring help desk operations into line with a company's business goals. Consultants also will develop help desk process models such as service-level agreements, escalation procedures and call-handling rules.

Amdahl: (800) 223-2215.

■ **Stardust Technologies, Inc.** *will host a two-day* **Advanced Network Application Programming with WinSock 2** *seminar December 13-14 at its Stardust WinSock Labs in Campbell, Calif.*

The seminar will be led by Martin Hall, who helped develop the WinSock API and is cofounder of Stardust WinSock Labs. Topics include WinSock architecture, protocol discovery and selection, advanced I/O features and considerations for moving from WinSock 1.1 to WinSock 2.

The course fee is $990 per person, with 15% discounts for companies that enroll three or more students.

Stardust WinSock Labs: (408) 879-8080.

■ **CompuCom Systems, Inc.,** *a Dallas-based PC services integration company, acquired* **Network Compatibility Group, Inc.,** *a network integration company in Columbus, Ohio.*

The acquisition will allow CompuCom to expand its systems engineering services in Ohio and Midwest regions to include LAN and WAN projects, help desk design and implementation, network management, field engineering, asset and procurement management, configuration and product distribution.

CompuCom: (214) 265-3600.

Building bridges: business needs meet tech realities

How to fulfill executive demands, build understanding relationships and win backing for network upgrades.

By Elisabeth Horwitt

Here comes the vice president of accounting into your office all fired up about this great package called Lotus Notes he saw on television the other night.

"Let's get all 400 of our sales managers on Notes ASAP — it sounds like a great productivity tool," he says.

"Great idea, but there's just one small problem," you reply. "Our network can't possibly support all the extra data Notes will generate." But the manager reminds you there is no money for an upgrade and suggests you make due.

You could keep pushing for the upgrade and risk becoming labeled a troublemaker. Or you could take a more passive approach and simply let network response time deteriorate until upper management gets the point that it's time to shell out for the upgrade.

A better strategy, sources say, is to have ongoing, two-way communication between the technical and business sides of the house.

The need for such communication is growing more important as the general workforce becomes more computer literate. Executives hear the network buzzwords that have gotten into the general media, and on TV they see nuns enthused about Web surfing.

> *"I don't think anyone can understand the complexities of a computer networking project unless they've been through it themselves."*

They also are discovering on their own the productivity benefits of LAN-based applications such as electronic mail and electronic calendaring. But they don't understand what it takes to make it all happen.

"I don't think anyone can understand the complexities of a computer networking project unless they've been through it themselves," says Cheryl Grossman, a senior network analyst at Transamerica Financial Services in Los Angeles. "There are more variables involved, and everything has to be absolutely precise. Typing one wrong letter in an INI file can mess up a project for months."

There can be a positive side to having senior managers initiate net projects. "Businesspeople have a much more imaginative vision and recognition of the possibilities of using technology," says Michael Serino, president of Intelliprise Resources, a Cambridge, Mass.-based consultancy. Once that vision can be meshed with IT's knowledge of networking realities, a firm is well on its way to getting a jump on its competitors.

Given that, both sides need to bridge the communications gap, Serino says. Just as businesspeople need a better grasp of distributed computing and networking realities, network people need to be more conversant about the competitive and business realities driving applications.

To accomplish that, it helps to have a neutral go-between, such as a consultant, or an internal person with a foot in both camps, Serino says.

The strategy works. A network planning analyst for a large retail chain, who asked not be identified, reports that his group recently got management to sign off on a budget that is almost double that of previous years. This victory stemmed from an effort to educate upper management on how network infrastructure increases in proportion to the company's growth.

"So [that upper managers] don't say, 'Your budget just grew X amount — how come?' we're showing them that it's their demands that did it; and I believe we've won that [battle] just in the last week," the analyst says.

Consider how much more effective that approach is than the alternative some network managers use, which is to let the network go down to grab executive attention.

"Our commercial people want to be on the Web to get to clients, but they don't see the technical stuff involved," says a data center manager for an international business information provider who asked not to be named. "It's nice to have a Web site, but if the backbone is not up to it, it's like having a facade without any substance behind it."

When upper management kept demanding such new applications but refused to OK necessary infrastructure upgrades, the manager let nature take its course.

"The systems actually did go down a couple of times. Screens just went blank," the data center manager recalls. "We got lots of angry messages from management, and in return, we sent out [an upgrade] proposition that we had made months earlier, requesting a sign off."

This was no real solution, however, because even then it took a year to get approval, the manager says. "Meanwhile, the business side continued to put in new projects. So we're still running behind."

Horwitt is a Waban, Mass.-based freelance writer specializing in network technologies. She can be reached via the Internet at 75244.1666@compuserve.com.

MANAGEMENT DATA ON-LINE

Network World peruses on-line services for interesting hints or tools that will make your job easier. Here are a few:

Training site

You can now go on-line to get the latest information about the series of seminars, conferences and other training aids offered by the MIS Training Institute and its sister organizations. Although the World-Wide Web site is still under construction, you can tap it to find out more about classes that cover everything from information systems and network auditing to understanding how to structure auditing boards and committees.

You'll also find information about the MIS Training Institute's Information Security, Center for Network and Client Server Development, Advanced Information Management and Infosecurity News divisions. These divisions provide specialized training to network technicians, administrators and other IT professionals.

Visit http://www.nwfusion.com for links to the World-Wide Web sites mentioned here. After you log-In, select Careers. While you're there, look for links to previous "Management Data On-line" columns.

A home for Management Information Bases

The University of Arizona maintains an anonymous FTP site where you'll find an expansive listing of standard and vendor-specific Simple Network Management Protocol MIBs for your downloading pleasure. Run by the Network Operations Group in the school's telecommunications department, the site includes MIBs spelled out in 23 Internet Engineering Task Force requests for comment that range from the standard MIB II and Remote Monitoring specifications to MIBs for managing Ethernet, token-ring and FDDI networks.

MIBs from leading vendors such as Digital Equipment Corp., IBM, Novell, Inc., Oracle Corp. and 3Com Corp. can also be found at the site.

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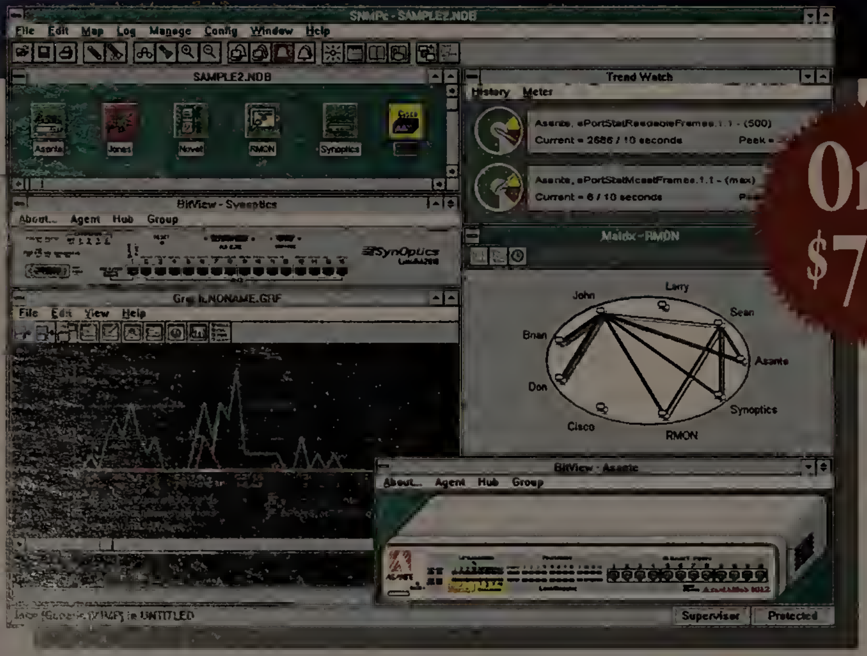

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New Frontier Technologies Software Brings NetWare Users to the Internet

By ANN KRAUSS

Frontier Technologies Corporation has announced the first NT-server based product that offers Internet access, TCP/IP and host connectivity for Novell NetWare environments. Called CyberJunction™, the product combines an innovative transmission gateway with a robust suite of Internet and host connectivity applications. This enables NetWare clients to connect to the Internet and other hosts with speed and security without running TCP/IP on every desktop.

CyberJunction is bundled with Frontier's robust web server, SuperWeb™ Server, allowing NetWare users to improve internal and external communications through the World Wide Web. The client product includes Frontier's award-winning Internet applications from SuperTCP Suite 1.2 and SuperHighway Access 2.

CyberJunction provides IPX to IP bridging through a Windows NT-based server, eliminating the need for TCP/IP software on every desktop. This protects the users' investment in NetWare and avoids the extra administration required to manage dual IPX and TCP/IP protocol stacks on each client PC. Transmission speed for customers is dramatically improved. By utilizing an NT-based solution rather than a NetWare NLM solution, performance of the NetWare network is not impacted. Neither the NetWare server nor client have individual IP addresses, protecting the LAN from intrusion from the Internet. This product also prepares companies for a gradual migration to an open-system TCP/IP environment.

"CyberJunction demonstrates Frontier Technologies' continuing commitment to develop market-driven product solutions," said John Teitgen, president of Frontier Technologies. "There is a huge installed base of NetWare networks with users that want to experience the benefits of the Internet. CyberJunction is an extremely easy-to-install, powerful and cost-effective solution that allows NetWare users access to the Internet and to the corporate TCP/IP network. In addition, the SuperWeb Server brings the power of web technology to the NetWare environment, allowing companies to improve their communications both internally and with the outside world."

CyberJunction Components

CyberJunction is a powerful NT-based IPX to IP gateway. The product is designed specifically for work groups, and includes a complete set of Frontier's award-winning TCP/IP and Internet applications, including a multi-protocol, commercial-grade browser, Internet organizer, MIME Email, telnet terminal emulation, FTP client/server, TN 3270, VT320, VT100 and remote utilities.

"CyberJunction fills a strategic gap in the market by providing Novell users with greatly improved connectivity and security, while at the same time giving their customers access to information via the World Wide Web," said Frontier Technologies senior product manager Joe Haley. "We provide a migration path to NT-based applications while protecting the embedded NetWare infrastructure."

Frontier's SuperWeb Server is a complete "enterprise information system." By combining client and server components, the SuperWeb Server dramatically improves the level of communications between workgroups, customers, suppliers and vendors. "In a competitive world, information is a weapon that separates winners from losers," said Haley. "SuperWeb Server gives its users a competitive edge."

Pricing and Availability

CyberJunction is available through Frontier Technologies' direct and reseller channels. CyberJunction is sold in 5, 10, 20, 50 and 100-user packages; pricing starts at $1795 for a 5-seat license. The SuperWeb Server is included with 50 and 100-user packages, and is otherwise available as an add-on for $795 with 5, 10 and 20-user packages.

Frontier Technologies Corporation is a supplier of Internet, networking and TCP/IP applications for personal computers. Frontier's networking software enables individuals to be more productive and business to be more competitive on a global basis. Headquartered in Mequon, WI, Frontier has offices in California, Pennsylvania, Europe and India, and employs more than 140 people worldwide.

CyberJunction, SuperWeb Server, SuperTCP Suite, Internet Organizer, SuperHighway Access for Windows and SuperHighway Access CyberSearch are trademarks of Frontier Technologies Corporation.

Photo by Tim Davis

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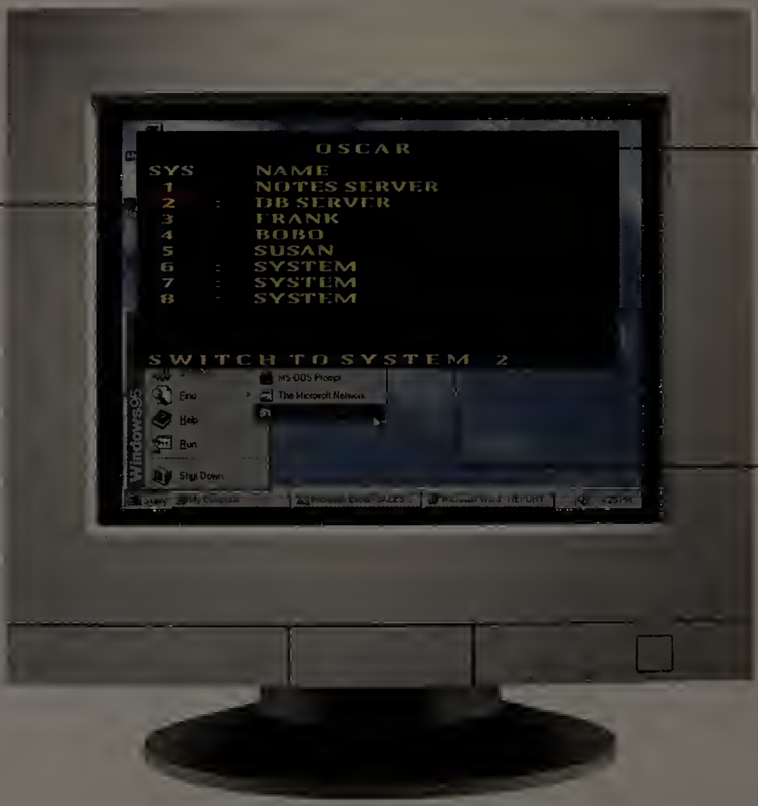

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 2    :    DB SERVER
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 8    -    SYSTEM

SWITCH TO SYSTEM  2
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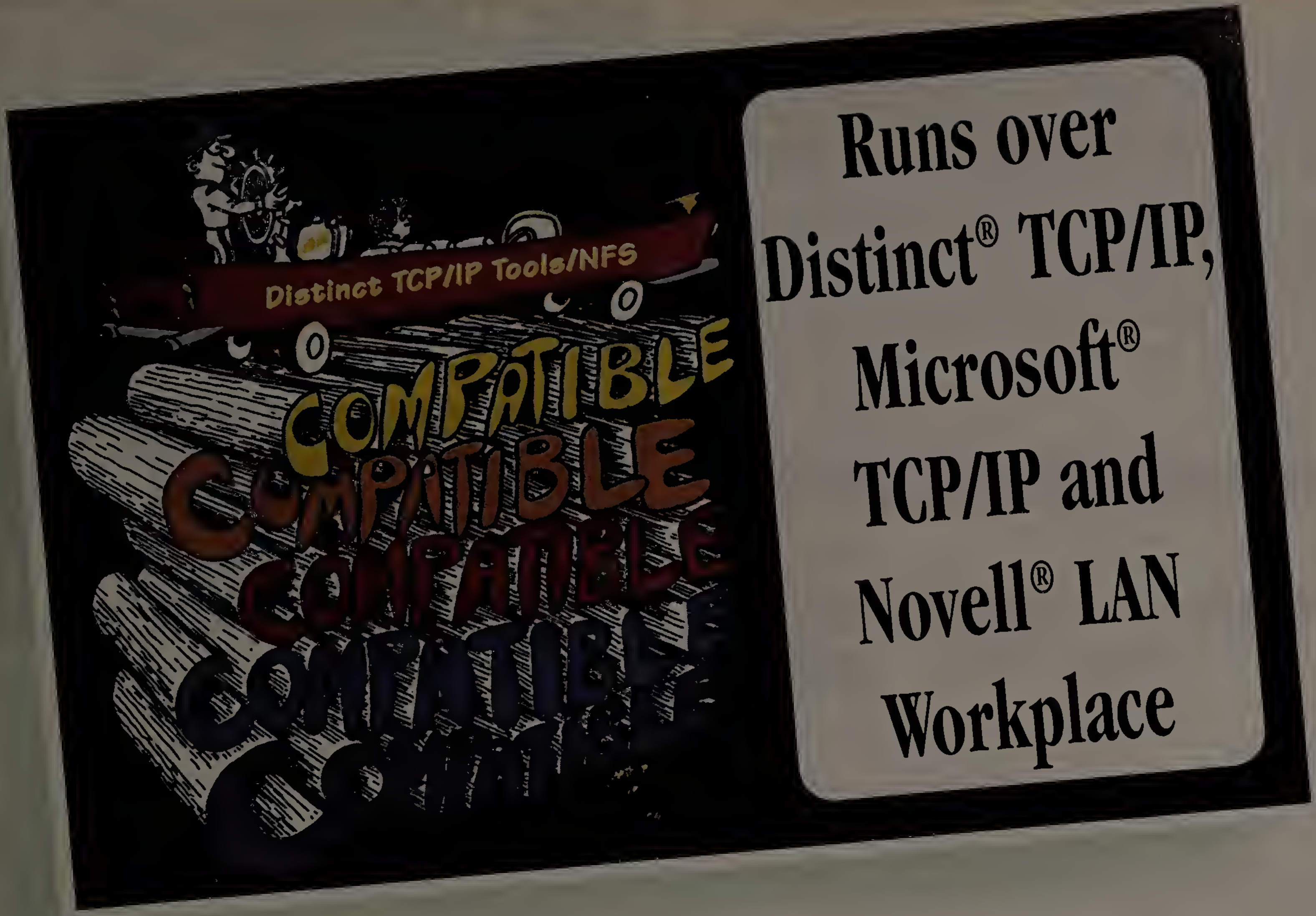
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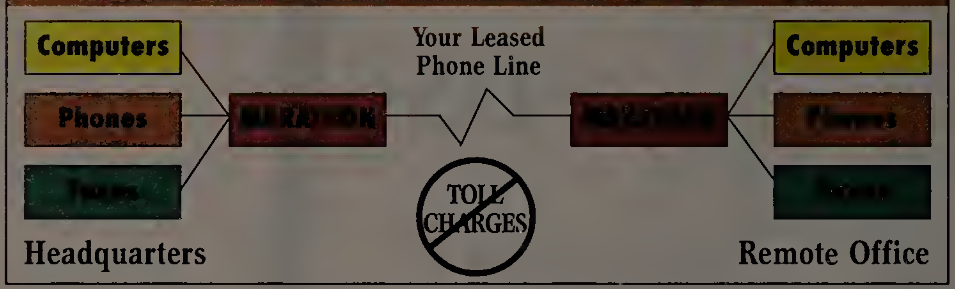

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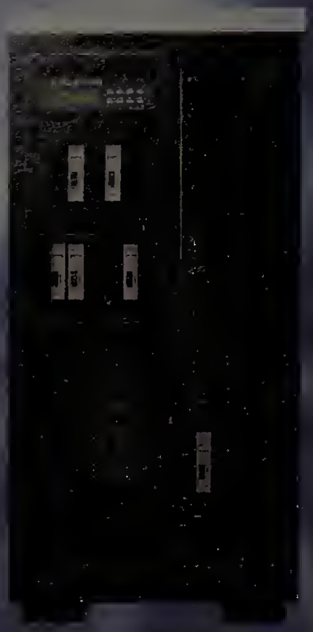

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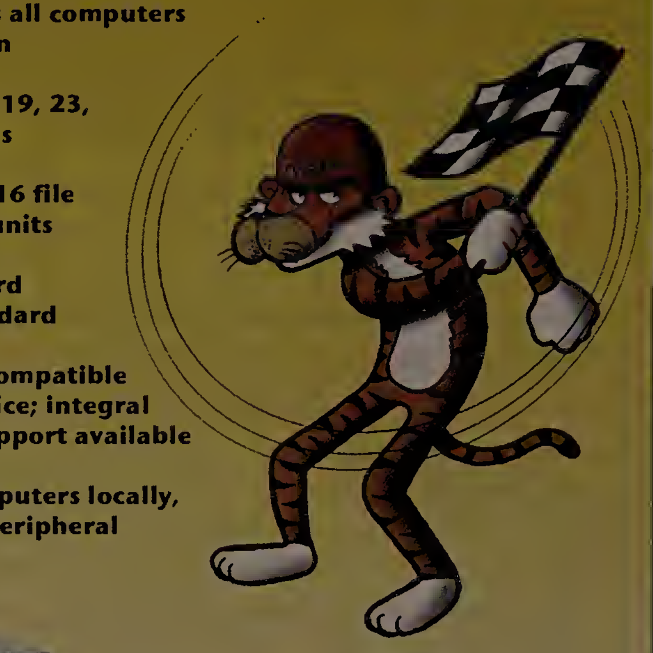

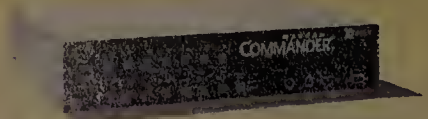

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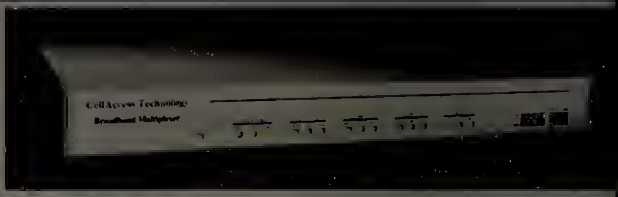

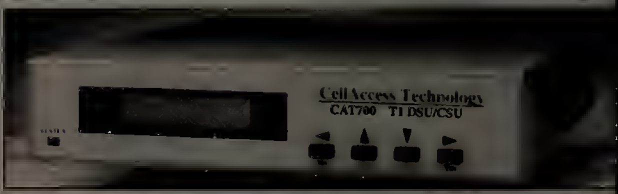

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114	115	116	117	118
119	120	121	122	123
124	125	126	127	128
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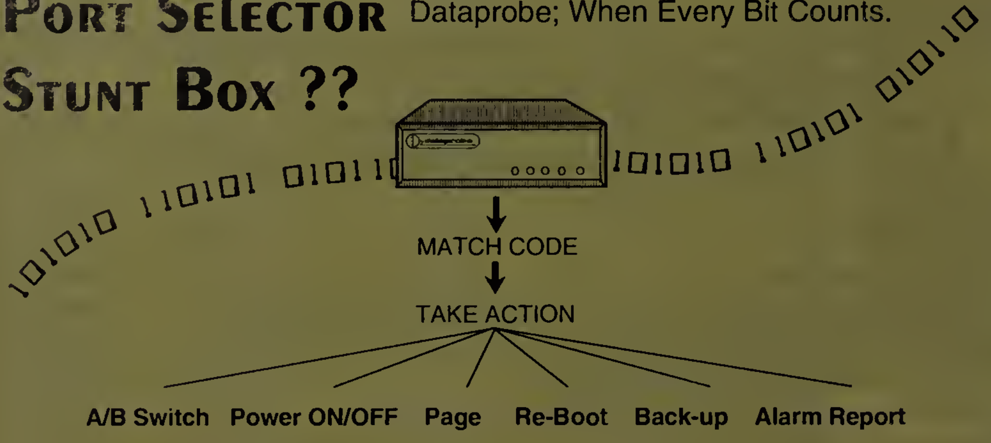

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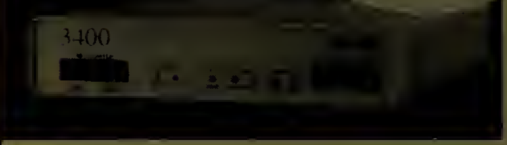

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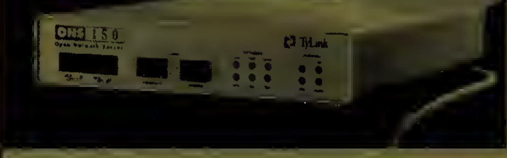

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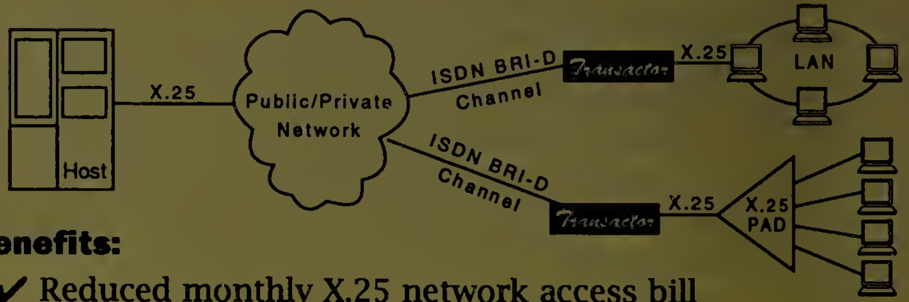

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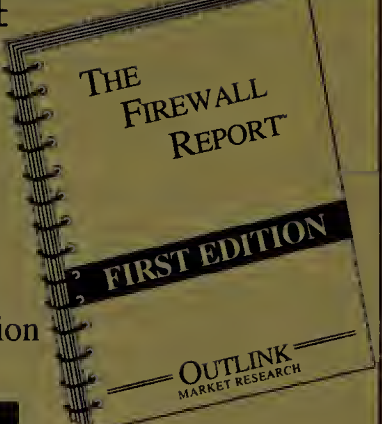

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A
Accent 37
ACSYS 24
Adaptec 28
Agile 26
Alantec 28
Amdahl 55
Ameritech 10
APC 6
Apertus 17
Apple 8,14
Arcada 25
ARDIS 70
AT&T 1,6,14,37
AT&T Wireless 70
B
BateTech 49,54
Bay Networks 1
Bell Canada 8
C
Cabletron 1
Cadis 6
Castelle 25
Cayman Systems 17
Cheyenne 25
Cisco 1
CNet 25
Compaq 1
CompuCom Systems 55
Compusearch 33
Computer Clearing House 33
Conner Storage Systems 25
Corel 28
D
Data Switch 28
Deverill Software Publishing 28
Digital 33
E
Excalibur 34
F
Frontier 49,52
Frye Computer Systems 47
G
Gandalf Technologies 28
General Signal 28
GTE 10
H
HP 1,6,24
I
IBM 1,6,8,14,17,22,25
IDS 37
Informix 33
Ingram Micro 28
Intel 14,47
International Network Services 24
Internet Junction 49,52,54
Ipswitch 49
IRI 33
L
LCI 1
Lotus 33
M
MapInfo 34
McAfee 25
MCI 1,14,18,70
MCS 49
Mesa 6
Microsoft 1,10,71
MobileWare 33
Motorola 8
N
NDC 25
NetManage 17
Netscape 1
Netsys 17
Network Compatibility Group 55
NetWorth 1
Newbridge 28
Novell 6,35,47,54
NYNEX 10
O
Oracle 33,35
O'Reilly 37
P
Performance Technology 49
Portable Graphics 37
Power I/O 28
Powersoft 33
R
RAD Network Devices 17
S
Saros 10
Seagate 42
SHL Systemhouse 18
SMCC 14
Sourcecom 17
Southwestern Bell Mobile 17
Sprint 1
Standard Microsystems 25
Stanford Technology 33
Stardust Technologies 55
Starfish Software 37
Sun 6
Sybase 33
Symantec 47
Symbionics 25
Sync Research 18
Systems & Networks 18
T
Tally 25
Tech Data 28
The Internet Connection 49
Thinking Machines 14
Thomas-Conrad 1
U
UB Networks 28
Unisys 47
US WEST 10
USoft 33
Utopia Technology 28
W
WinStar 70

Enterprise LAN management Buyer's Guide vendors are listed on page 46.

NetworkWorld's Advertiser Index

Advertiser	Reader Service#	Page#
3Com Corp	30,31	12-13,30-31
ACC	33	4
Access Media Inc		40
Adaptec		23
AT&T		11,25
Bellcore	34	2-3
Btrieve Technologies	26	7
Centron	36	35
Compaq Computer Corp		74-75
COMNET		36
Cray Communications	32	29
Crosscom Corp	27	9
Digi International		20-21
Digital Equipment Corp	28	19
Hewlett-Packard		76
IBM		15,27,38-39,50-51
LanOptics Inc	29	26
NHC Communications		17
NetManage Inc	35	16
Unisys Corp		32

Marketplace Advertiser Index	R.S.#	Page#
ADIC	246	64
Apex PC Solutions Inc	266	60
Berkeley Software Design Inc	226	63
Castle Rock Computing	252	58
CellAccess Technology	275	64
Cybex Computer Products	227	64
Datatech	236	62
Distinct Corp	273	61
Frontier Technologies	274	59
MaxNET	267	64
NHC Communications	230	62
TGV Inc	261	62
Wright Line	279	58

ActionCenter

CNT/Brixton Systems Inc	109	67
Dataprobe Inc	110	68
Microtronix	114	68
Network Dimensions Inc	115	68
Outlink Inc	112	68
Telenex Corp	111	68
TyLink	113	68

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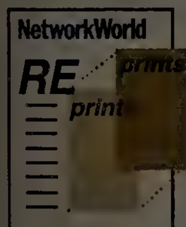

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ARDIS takes wireless strides despite layoffs

Firm also forced to deal with resignation of key executive.

By Joanie Wexler

Las Vegas

Despite layoffs and a key executive resignation last week, ARDIS Co. stuck to its guns at Comdex/Fall '95, promising to plug wireless data networking holes through third-party software.

In a move that reflects the wireless data market's inability to turn a profit, the company laid off about 20% of its workforce. In addition, Rob Euler, vice president of business development, resigned. Euler's resignation came a few months after former ARDIS President Frank Wapole was reassigned by ARDIS parent Motorola, Inc. to a regulatory role in Washington, D.C.

Dan Croft, ARDIS vice president of marketing, said the layoffs were aimed mainly at personnel involved in the network buildout and that the company is actually hiring in the areas of sales, marketing and application development.

"The [use of the network] has not kept pace with network expansion," Croft said.

The company is turning away from its efforts to erect more base stations next year, according to Croft.

Meanwhile, ARDIS and AT&T Wireless Services are marching onward in trying to solve some of the major problems that have plagued wireless data. One has been the dearth of options to allow mobile workers to connect over wireless networks from laptops directly back to their corporate resources.

ARDIS last week announced that it is supporting River Run Software Group's Mail on the Run software for providing users of Apple Computer, Inc. Newton- and General Magic, Inc. Magic Cap-based personal communicators remote access to LAN-based Microsoft Corp. Mail and Lotus Development Corp. cc:Mail. ARDIS already supports AirMobile for cc:Mail, which achieves the same function for Windows-based portable computers.

Such products preclude users from having to buy another messaging service with another mailbox from companies such as RadioMail Corp. or Wynd Communications, Inc.

But users will "still have to get MIS buy-in, which will be difficult," said Andy Seybold, a wireless consultant and editor of the "Outlook on Mobile Computing" newsletter in Boulder Creek, Calif. "Users are going to have to say, 'Hey, boss, I want to try wireless. Buy me an X.25 link [to the nearest ARDIS point of presence],' " a requirement of the system, he said.

However, such offerings move the industry in the right direction. Mail on the Run beta customer Ian Clark, a computing analyst at Chevron Information Technology Co., said ARDIS' support of the software will cinch his consideration of Magic Cap products as mainstream items for his mobile workforce. ■

> *"Users are going to have to say, 'Hey, boss, I want to try wireless. Buy me an X.25 link [to the nearest ARDIS point of presence].'"*

AT&T partners to push wares

From the other side of the convention floor, AT&T Wireless Services said it would provide wireless extensions to Microsoft Corp.'s Exchange messaging platform when it ships early next year.

AT&T said it is teaming with Microsoft and an unnamed company to build a separate driver to streamline Exchange for more efficient use of narrow-capacity wireless links. It also has teamed with reseller Inacom Communications and computer distributor GBC Technologies. The carrier also said Norand Corp.'s PenKey 6100 ruggedized, handheld computer will support its Cellular Digital Packet Data and circuit-switched data services.

MCImetro will hop over the local loop

By Tim Greene

New York

Fed up with local exchange carrier (LEC) roadblocks, MCImetro plans to hop over the local loop by using radio connections to link customers to MCI Communications Corp.'s long-distance service.

MCImetro, a competitive access provider (CAP), has signed a five-year agreement with WinStar Communications, Inc. to use WinStar's Wireless Fiber digital technology to extend the reach of its local fiber rings, according to Sandy Fain, MCI's director of local product development.

MCImetro plans to use the wireless links in cities where its coverage overlaps with the 41 areas where WinStar offers Wireless Fiber, its name for line-of-site radio links.

Wireless Fiber can deliver up to 16 T-1 circuits from a single radio unit.

A user needing more capacity could mount another antenna for an additional 16 T-1s.

The radio links could connect users with MCImetro local Synchronous Optical Network (SONET) fiber loops or directly to MCI long-distance points of presence.

According to Fain, the dominant LEC in Atlanta, BellSouth Corp., and other local carriers pose barriers to CAPs. This includes a reluctance to sell CAPs just the elements of local

See **MCImetro,** *page 72*

Compaq

Continued from page 1

research at Aberdeen Group, Inc., a consulting firm in Boston, said "server internetworking" will appeal to small installations as well as enterprise users.

Robbins said enterprise users should not overlook the idea of using the server to house multiple network technologies, because it could help consolidate equipment costs. He pointed out that many internetworking technologies are already starting to mature to the point that they are becoming commodities, meaning users often do not need to spend time searching for best-of-breed products.

GO FOR IT

Server giant Compaq has good reason to go after the internetworking market. It is expected to be a $30 billion industry by the year 2000, according to Menlo Park, Calif., consultancy Dell'Oro Group.

The customer's perspective

Based on what has been learned about consolidating network functions in chassis-based hubs, users have mixed feelings about the benefits of designating the server as the integration point in the network — a market that any number of server vendors may wind up pursuing.

Scott Davis, computer systems engineer at Tide Water Community College in Portsmouth, Va., is employing Cabletron Systems, Inc.'s Multi Media Access Center hub chassis with integrated Cisco router modules.

He likes the consolidation so much that he is also looking to incorporate a hub module to convert SNA traffic into LAN traffic and add a remote access module.

"I like having everything in one place because it simplifies management," Davis said. "It's all condensed in one closet, and I don't have to worry about multiple devices hanging out at different places."

John Hoag, vice president of systems at Sage Clearing, Ltd. in San Francisco, is another fan of consolidation at the hub.

"Having the equipment all in one box makes things easier from an administrative standpoint, especially for my remote offices," he said. "When I use [Cabletron's] RemoteLAN View, I can see everything in the hub, as opposed to having things scattered around the net on racks."

Davis said the same integration approach could work with servers and that it makes particular sense to incorporate remote access technology into a server. "Users are dialing in to access the file server, so this would give them direct access. This could improve performance."

But users and analysts cautioned that employing the server as the place to meld multiple network technologies, such as routing, could be problematic.

"There could be some contention for processing power," said Tom Bain, a research analyst at META Group, Inc., a consultancy in Reston, Va. "Every time a routing decision has to be made, it's got to interrupt the application or file server functions, do the processing, then click back into server mode."

But Bain said that if a separate card is used with its own processor, the routing software can be loaded so that it does not interfere with the centralized processor doing the file and print server functions.

Users should beware of Compaq's limited routing expertise, he added.

"If Cisco said they were going to do the integration, there's more credibility there because they own the code," he said. "But Compaq doesn't really have a great deal of knowledge of routing software, and it will be a challenge for Compaq to port the code to an industry-standard platform and make it work."

Most users and analysts pointed out that having the server anchoring multiple network functions creates a central point of failure. "If the server goes down, I lose the whole network," Bain said.

Server vendors also seem to lack sophisticated management platforms, unlike their internetworking counterparts, analysts said. While Compaq has its Insight Manager tool, the technology is not as mature as management platforms from the big hub vendors, such as Cabletron's Spectrum or Bay Networks, Inc.'s Optivity.

Even with these concerns, industry observers seem anxious to see how much value server vendors can add to their products. ■

To integrate or not to integrate

"I'm not sure how easy it will be for a server vendor to pull off this level of integration. Hub and routing capabilities are much more alike than server and router capabilities."

Scott Davis, Tide Water Community College

"Conceptually, it's easier to design a network where you have one box that houses all of your network technologies."

John Hoag, Sage Clearing

"Seems to me like it's going to be harder to spread the load over your network and have the flexibility to route things along other paths."

Ray Grant, director of information technology services, Portland Community College, Ore.

ATM migration

Continued from page 1

to be used with a compatible workgroup concentrator or ATM switch module. ATM LAN Emulation software would be added to support existing applications.

While IBM would not comment directly about this technology, many industry experts said the scenario is plausible.

"The basic technology in both the IBM LANstreamer and the 25M bit/sec adapters is the same, but the way they encode data is different, but that could be handled by software," said Bob Rosenbaum, vice president of sales and marketing for token-ring switch maker Nashoba. "The drawback here is that users would have to have the very latest versions of the LANstreamer adapters and must support full-duplex token ring."

"ATM to us isn't viable yet because of the cost," agreed John Arnett, manager of technical planning for Sea-Land Service, Inc., the container shipping division of international transportation giant CSX Corp. "If a viable, inexpensive method of getting from token ring to ATM were available, it would be of great interest."

The second scenario IBM is evaluating is based on Cells in Frames (CIF), a technology that several vendors, along with Cornell University, are developing and piloting. CIF was designed to help the university move its 10,000, mostly Ethernet-attached workstations to ATM without tossing out the existing Ethernet boards.

CIF would let Cornell support multimedia and other ATM-based applications on PCs by encapsulating 53-byte ATM cells in Ethernet frames moving at 10M bit/sec. A CIF Access Device at the other end of the connection strips off the Ethernet header and sends the ATM cell onto the ATM backbone.

Sources said IBM could use CIF-like capabilities to encapsulate ATM cells in token-ring frames and move data along the same way CIF handles Ethernet.

The CIF technology is not as attractive as the other scenario, analysts said, because it adds a ton of overhead to the LAN. "The ideal solution is one that, with new software, a workstation would be able to send cells out with a minimum of token-ring framing," Guruge said.

It is unclear which tack IBM will take, but it confirmed that it has looked at the CIF technology and other items. An IBM spokeswoman said IBM was looking into a number of ways — including the CIF and LANstreamer options — to make it easier for users to move into the ATM environment but noted that nothing was actually in production yet. ■

NT OpenMail

Continued from page 1

ers — Exchange in particular — and possibly displace them. Many shops have relied upon OpenMail as the backbone, and used clients and departmental post offices from other vendors.

Other HP developments include a graphics-based electronic mail management tool based on the firm's OpenView AdminCenter application that will let companies administer both X.400 and OpenMail Message Transfer Agents.

The firm also will introduce a Windows client for its group scheduling application.

HP is expected to discuss some of these efforts at the EMail World & Internet Expo next week in Boston.

Despite HP's agreement to support Notes, one industry source said the company sees HP's overall package as a competitor to Lotus and Microsoft's messaging offerings. HP hopes to continue to carve out a niche with the large firms it courts.

"Corporate 1,000 type customers have heterogeneous environments," the source said, "and NT is a new one emerging into the mix."

Bob Stevens, BellSouth Corp.'s manager of collaborative computing, said it is difficult for firms like his, with 50,000 end users, to stick with one operating platform. About 80% of these end users see OpenMail, and 10% to 15% need Notes for its rich text capabilities. An HP-provided gateway BellSouth is testing provides the Notes/OpenMail link.

As a heavy OpenMail user, Stevens wanted NT available to him as a server platform and perhaps eventually on the desktop.

Stevens was also interested to hear that HP is considering melding Netscape's tools and OpenMail into a Web/messaging product, sources said. That deal has not been finalized.

An industry source said that HP is interested in having a Web browser that will incorporate E-mail and security services, and allow users to launch desktop applications. "It will put [a HyperText Transfer Protocol] interface to the OpenMail message store so you can look at your OpenMail messages from a Web browser," one source said.

The goal is to tap into the omnipresence of browsers. "Essentially, once you get into that navigator environment, you won't need to leave it," the source said. "It'll be a groupware desktop environment, and [HP] will be the messaging server. Netscape will provide the Web server."

The source added that HP is trying to provide synchronization between an OpenMail discussion database and Usenet discussion groups on the 'Net.

If the Netscape deal occurs, sources said, OpenMail could distribute Web pages over E-mail, as does Lotus' Notes 4.0 Navigator. ■

SIFTING THROUGH HP'S MAIL

HP's Unix-based OpenMail generated $15 million in revenue last year, based on 923 server and host licenses, according to market research firm IDC in Framingham, Mass.

Microsoft spins Web beta

By Peggy Watt

Redmond, Wash.

Microsoft Corp. this week will release to a widespread beta audience its first Web server product, Internet Information Server.

Formerly called Gibraltar, the product is intended to host World-Wide Web pages and disseminate data. It will not provide the security necessary for business transactions, according to David Malcolm, a product manager in Microsoft's business systems division.

Microsoft's goal was to make the product easy to set up and maintain. "It's not meant for conducting secure business on the Internet," Malcolm said. "It's meant for publishing information."

> *"It's not meant for conducting secure business on the Internet. It's for publishing information."*

However, the server supports the Secure Sockets Layer, promoted by Netscape Communications Corp., in addition to Microsoft Private Communication Technology extensions.

For secure commerce transactions, Microsoft is developing a merchant server and security tool dubbed Catapult.

Corporate and commercial developers can build on the Information Server API to integrate applications, said Rich Tong, a general manager in Microsoft's business systems division. The server comes with File Transfer Protocol and Gopher support, but there are many third-party development opportunities.

The Internet Information Server also integrates with other members of Microsoft's BackOffice family of server applications.

For example, a database connection tool, bundled with the beta, converts HyperText Transfer Protocol (HTTP) format to any database compliant with Microsoft's Open Database Connectivity (ODBC) spec. Users calling a Web site based on the Internet Information Server can submit HTTP messages that the Microsoft utility converts to a SQL query, then retrieve data from Microsoft SQL Server or another ODBC-compliant database.

Microsoft will bundle with its beta a 16-bit Mosaic client browser as well as its own 32-bit Explorer 2.0 browser.

The company is distributing beta copies of the server to about 15,000 Microsoft Solution Providers, corporate customers and software developers, as well as anyone who requests a copy through Microsoft's Web site, www.microsoft.com. ■

AT&T

Continued from page 37

The long-term vision is to link the AT&T transaction processing platform to the Web hosting platform. This should effectively broaden AT&T Electronic Commerce Solutions customers' ability to reach Internet users. Internet links and credit card processing features are slated for deployment in mid-1996.

In addition, users of AT&T Network Notes could collaborate on a document and launch it on their AT&T-hosted Web site, said Gary Hickox, application and imaging services vice president at AT&T.

AT&T last week broadened Network Notes' global appeal. The service now lets international customers dial a local number that transfers them back to the AT&T Network Notes server farm. Until now, such sites had to place a long-distance call back to the U.S. to hook in.

The electronic commerce offerings are aimed squarely at AT&T's one million 800 call center customers, which are now generating more calling volume than AT&T's long-distance business, according to John Petrillo, president of AT&T's Business Communications Services. ■

NetworkWorld

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Second-class postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

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ISSN number: 0887-7661.

Frame relay

Continued from page 1

company officials confirmed last week.

And other carriers reportedly are offering a full month's credit on frame relay service for both port and circuit charges in exchange for a term contract commitment.

AT&T is offering a $200 credit on the typical 64K bit/sec frame relay port, which ordinarily costs $273 per month. The carrier will hike the credit to $400 for users who dump a competing carrier's frame relay service — more than erasing the first month's cost.

The double credit marks the first appearance in fast-packet data services of AT&T's Winback incentive program, which the carrier has used liberally to fight market-share erosion in everything from residential long-distance to commercial switched voice services.

The frame relay Winback deal is a response to users who want to change back to AT&T but have time remaining on an existing term contract and are facing termination penalties if they switch, explained Carolyn Tommie, AT&T's InterSpan product manager for distribution strategy.

"We were getting requests from the field," Tommie said. "When you hear something like that, you move to put something in front of them."

AT&T also is looking to help users who are close to exhausting their budgets for the calendar year but eager to lay a foundation for 1996 wide-area networking objectives, Tommie said. AT&T itself is counting on the promotion to put up good frame relay numbers, she added. "Like any business, we want to have a very strong performance for our fourth-quarter results," she said.

In fact, AT&T's promotional offer expires Dec. 1, and users who take up the offer must begin installation of their networks by Dec. 31.

Other carriers have added to their negotiating arsenal by empowering account executives to eliminate all interexchange carrier frame relay charges — those other than access lines provided by local exchange carriers — in particular months, said Scott Booth, director of data services for LCI International, Inc.

For most new contracts, LCI is offering one month free for each year of the contract — over and above a percentage discount on each rate element throughout the contract term.

"Every carrier is pulling out the stops," Booth said. "It's absolutely unbelievable what you have to put on the table to win business."

Each major carrier is also offering to put the free months in the front of the contract as part of a trial period, Booth said.

Tommie confirmed that AT&T will offer such an arrangement, but only if a contract is firmly in hand.

Officials at MCI Communications Corp. and Sprint Corp. did not respond by press time. But Ellen Block, a Washington, D.C. attorney who negotiates network services contracts, said MCI and Sprint are pushing these offers especially to big corporations whose AT&T Tariff 12 deals for switched and private line services are expiring.

This gives AT&T's competitors a wedge to help wean these customers away from AT&T for their basic voice and data needs, Block said. "AT&T is less likely to be cooperative [on a Tariff 12 renewal] if you go off and turn to Sprint for frame relay," she said.

She added that users should try to get their frame relay incentives up front rather than over the life of a contract because the Federal Communications Commission recently ordered carriers to file frame relay tariffs without guaranteeing that existing contracts will be honored. ■

Thinking Machines

Continued from page 14

usability of distributed systems or parallel systems," she said.

The middleware-style software package is intended for departments all the way up to enterprise-level corporations.

"I like the concept of it," said Eric Gasior, a network administrator at NASA-Goddard Space Flight Center in Greenbelt, Md. "Anything that takes advantage of unused clock cycles when somebody is not doing something on a machine really maximizes the value of a workstation or a PC, or whatever platform you're going to run it on."

Clustering technologies appear to be gaining steam. In October, Compaq Computer Corp. announced an agreement with Tandem Computers, Inc. and Microsoft Corp. to support their clustering technologies.

GlobalWorks will be sold on a per-node basis. For an eight- to 16-processor node system, the cost would be about $50,000. The cost for GlobalWorks goes down as the number of nodes goes up.

The product is currently in development. GlobalWorks is expected to be in beta testing by February of 1996. ■

Server suite

Continued from page 1

ager, an X.500 directory and security product based on Open Software Foundation, Inc.'s Distributed Computing Environment.

And if Eagle comes bundled with hardware, as IBM officials have hinted, the suite could be much simpler to buy and use than BackOffice (*NW*, June 26, page 1).

The Eagle suite initially will be based on the OS/2 Warp Server network operating system (NOS) that IBM plans to release in the first quarter of 1996.

But the company will make AIX and Windows NT Server versions available next year, as well, according to Art Olbert, vice president of LAN systems for IBM's Personal Software Products division.

IBM officials have suggested in the past that the company would offer a suite to compete with BackOffice, but confirmed details of the suite for the first time at Comdex/Fall '95 here last week.

Prices were not available, but Olbert said all the products would adhere to a common pricing model.

The full suite will not be available until late next year, after IBM has completed development of some products, including Warp Server and DSS, and has had a chance to port existing products to Warp Server, Olbert said.

Putting it all together

Applications in the suite will not be closely integrated with one another initially, but IBM will standardize the licensing and packaging of the products to make them consistent, and tune them to run compatibly on the same server.

DSS, due in the first quarter of 1996, will form the basis of the integration. It will give users a single logon to all the applications and locate files and data shared among them.

Only Warp Server will support DSS at first. Users will be able to take OS/2 Warp Server as is — with a domain name service — or add on DSS for greater security and a single logon across an enterprise net, Olbert said.

Initial versions of the other applications will not support DSS, but the whole suite will eventually, he said.

Despite trailing Microsoft in server suites, IBM still has the credibility among users to build a nest for Eagle in the market, said Mark Ryvola, president of Cyberware, Inc., a San Jose, Calif.-based wireless LAN products company.

The suite approach is the right one for IBM, which needs to simplify the packaging and installation of its products, he said.

First, however, the company has to convince users it will continue to back OS/2, both as its desktop operating system and core NOS.

"IBM needs to make a strong statement that it's backing OS/2 because there has been a lot of uncertainty in the market," Ryvola said.

IBM is backing OS/2 now and will in the future, with marketing efforts and new product development, according to John W. Thompson, general manager of IBM's Personal Systems Products division.

Not only is the company developing new versions of the OS/2 server, it is also working on a desktop version code-named Merlin that will be based on a microkernel.

In addition, the desktop version will include a better user interface, and add better security and I/O queue performance, Thompson said. ■

Bundles of joy

IBM's Eagle is a software bundle analogous to Microsoft's BackOffice.

Software bundle	Eagle	BackOffice
NOS	OS/2 Warp Server, AIX or Windows NT	Windows NT
Groupware	Notes 4.0	Exchange Server
Network manager	SystemView for OS/2 Warp Server	Systems Management Server
Database	DB2 for OS/2 Warp Server	SQL Server
SNA gateway	Communications Manager for OS/2 Warp Server	SNA Server
Internet gateway	Internet Server	Internet Information Server
Transaction monitor	CICS	None
Directory	Directory & Security Services	None

MCImetro

Continued from page 70

connection they need to provide local service as opposed to the bundle of services and hardware that make up a complete retail local service offering.

Beyond their reluctance to unbundle, LECs also hinder would-be competitors such as resellers by making wholesale prices unprofitably close to retail prices. In addition, they make it difficult for users to switch local carriers and keep the same phone number, which is important to many businesses.

Rather than fight those battles, MCImetro has decided to leap over them by buying the local connection from WinStar.

While MCImetro plans to offer local switched telephone service, the wireless links will be used only for dedicated access, according to an MCI spokesman.

If MCImetro gets regulatory authority to provide switched local dial tone, it might use WinStar to facilitate that, too, the spokesman said.

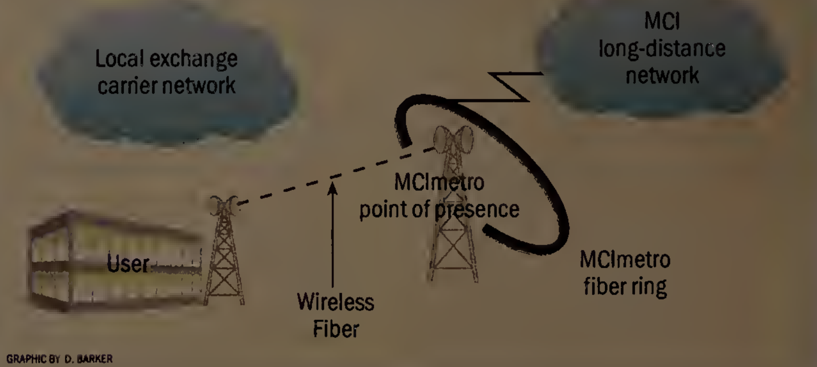
Robert Rosenberg, president of Insight Research Corp., a Livingston, N.J., telecommunications market research firm, said the wireless connection could mean more options for users with campuses remote from the MCImetro fiber rings.

Without wireless, provisioning the link at a competitive price might be impossible, according to Rosenberg.

WinStar said the price for a T-1 link is 15% below the price of a wired T-1 from a LEC and is even less expensive if the service is bought in bulk as MCImetro is doing. ■

Alley-oop the local loop

Using WinStar's Wireless Fiber technology, MCImetro plans to hop over the local loop to link users to Its network.


Local exchange carrier network
MCI long-distance network
MCImetro point of presence
User
Wireless Fiber
MCImetro fiber ring

GRAPHIC BY D. BARKER

Back to Reality

The inter-personal computer is a Trojan horse that will only benefit vendors

Thirty-two centuries ago, hormones warped the better judgment of the king of Troy's son. The horny kid ran off with the wife of an influential Greek. The Greeks retaliated with a 10-year war against Troy.

According to Homer's mythology, this silly war ended when the Greeks pretended to skip town, leaving behind a large, hollow wooden horse stuffed with warriors. You know the rest of the story.

David J. Buerger

Certain large vendors in this industry have decided to replay the Greek gambit. I'm talking about the so-called network computer, first pitched by Oracle Corp.'s Larry Ellison last month at the Telecom 95 expo in Geneva.

Network managers beware: This device is a Trojan horse, deadly as the ancient wooden version that toppled Troy.

The network computer sounds cool on the surface. Pseudovisionaries say this information appliance will have a large monitor, keyboard, a chunk of memory and a basic I/O system. The operating system and applications would be downloaded over a network. All data files — corporate and personal — would be kept on a network server.

Users will be able to surf the 'Net, do E-mail, word processing, videoconferencing and more — all for about $500.

IBM's Louis Gerstner is a new convert to network-centric computing. First detailed last month in *Business Week*, Gerstner defines this as the successor to microprocessor- and mainframe-based eras. (He actually stole this idea from analyst Mark Stahlman and Sun Microsystems, Inc., which pushed the Tofflerian wave theory during the late '80s.)

Last week at Comdex/Fall, Gerstner said the network-based inter-personal computer (IPC) would provide "more memory, more storage, more processing power than you would ever be able to justify in a personal computer or maybe even put in a personal computer." The actionman said IBM would ship versions of the IPC early next year.

Dumb terminals, diskless workstations, X terminals and now IPCs. Unfortunately, every time history repeats itself, the price goes up. Let's examine what this "cheap" gimmick will really cost.

For regular PC makers, an aggressive push to the IPC could signal their end. A Nov. 1 *Wall Street Journal* article chronicled the sorry financial state of PC vendors. Most operate on razor-thin margins, despite prices that continue to rise. Last year, for instance, IBM's PC division lost a billion dollars. An IPC would be priced at least one-third less than a typical PC — a guaranteed loss. Or is it?

PC vendors, such as Dell Computer Corp., have condemned the IPC concept. Duh! They have nothing to gain. But big systems companies, like, IBM do. Here is their secret strategy:

IPCs cannot work without a huge new infrastructure. They require superfast networks, new software, large servers, complex network and systems management, and systems integration.

"Ka-ching" go IBM's cash registers.

Wanna kick-start ATM to every desktop and branch office? Need a way to boot out old solutions and replace your application base? How about retrain your entire support staff?

IPCs are the answer. IBM and other large systems vendors will be happy to help — for a big, ongoing fee.

There are some benefits to this scheme, such as less expensive software updates and lower hardware maintenance costs. Oh yes — rigid control also would return to people who manage corporate information systems. But is this what users want?

Frankly, a world where all applications reside on a server would be a step backward for everyone. The benefits of computing have skyrocketed because of its now-distributed nature. Centralized IS structures used to throttle creativity. Why would users want them to regain power?

The IPC's lack of a big, personal fixed-disk drive would place users at the mercy of whomever manages the network computer. Some centralized data is essential for line-of-business applications. Centralizing all data and applications is not.

Regular PCs empower people because users can customize them at will. Yes, that comes at some organizational cost. But recentralizing everything would kill the goose that lays golden eggs.

Try as they might, large systems vendors must learn that they cannot turn the clock back to the good old days of ironclad account control. Users are enjoying benefits of demystified computing. They should not let this Trojan horse stifle that freedom.

Buerger is an Atlanta-based writer and industry consultant. He can be reached at dbuerger@pipeline.com.

CyberSpeak

Voices from the reader network

Is there a need to upgrade to Pentium Pro machines right away?

■ "This question largely depends on whether one wants to stay on top at the cutting edge of technology. Considering that the base Pentium Pro is so much faster than the fastest Pentium available and has more cache memory, one might be inclined to think that we must upgrade to Pentium Pro right away."
Annajeerao Nott, research associate, Georgia Institute of Technology, Atlanta

■ "There will be a place for the Pentium Pro, but environments with plans for clustering will probably have a mix of hardware and lean more toward RISC-based Alpha processors for high-end SQL work and [symmetric multiprocessing]."
Frank Caratozzolo, senior information specialist for a major East Coast pharmaceutical manufacturer

■ "Those who use 32-bit operating systems such as Unix, Windows NT or OS/2 and who also use those [operating systems] to serve database applications using a 32-bit SQL database will find a tremendous need for the Pentium Pro. The Intel X86 platform will continue to place in the top ranks for price/performance when compared with other database servers, so upgrading your mission-critical systems to Pentium Pro only makes sense."
Michael Marchuk, manager of research and integration, Follett Software Co., McHenry, Ill.

NEXT QUESTION

Will Web browsers become the much-sought-after "universal network client?"

Responses due by 8 p.m. Thursday, Nov. 30. You'll get a T-shirt if we print your response. Please include your name, title, company and address.

NEXT WEEK: Don't miss "Abend," our back-page column that alternates with "CyberSpeak" and brings you humorous items, oddities, marginalia and other insights from the Internet and elsewhere. Send items to network@world.std.com or get in touch with us any other way you can think of.

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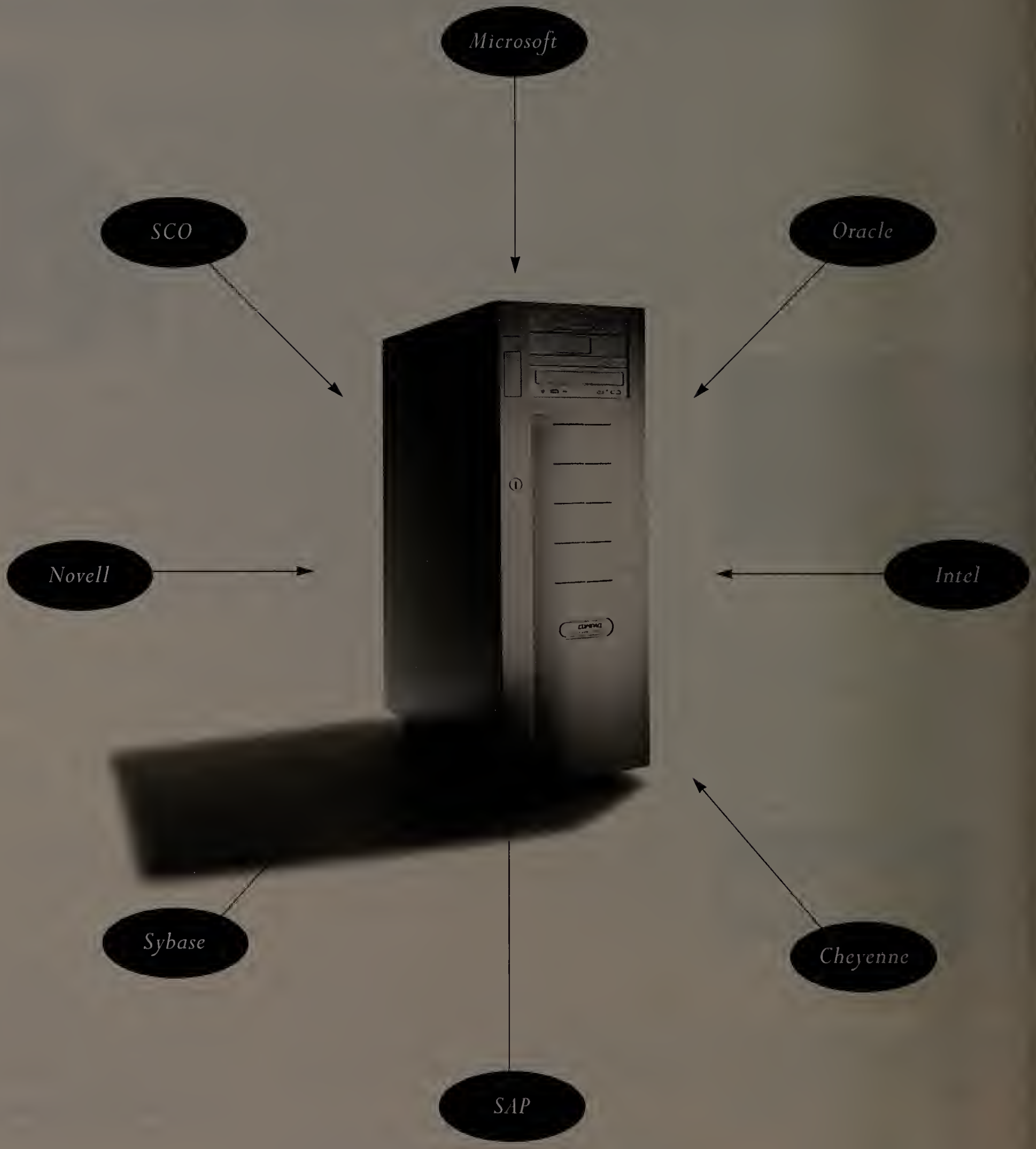

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Any computer company can build hardware that runs software that runs your business. Or can it? After all, this is your business we're talking about here. Do you really want to trust it to mere hardware? At Compaq, we're betting you'd prefer an easy-to-use, fully thought-out solution. A solution that is the right combination of server, operating system, and database application that solves the puzzle of your varied computing needs.

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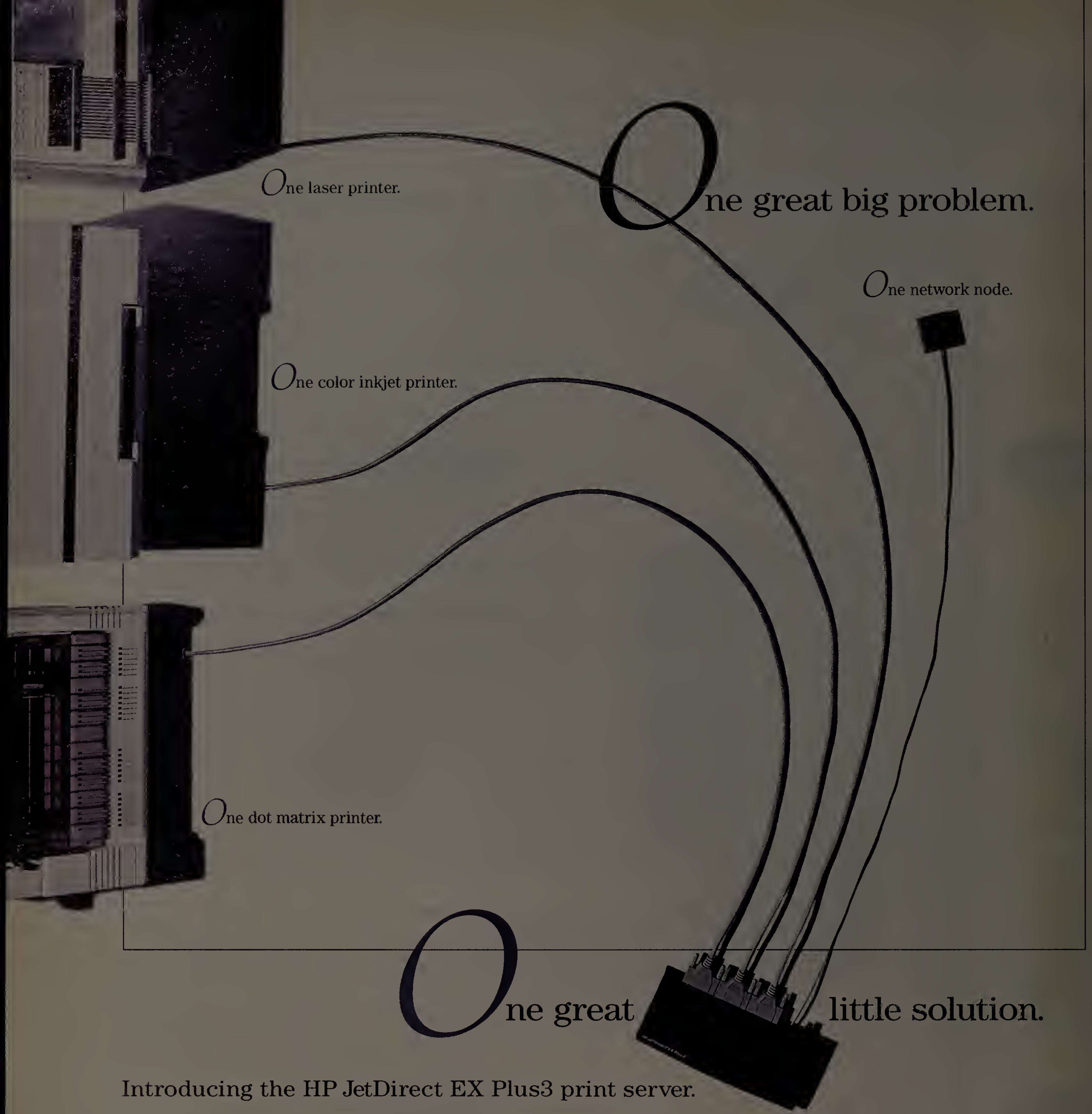
You see, they may be Compaq servers. But they are Compaq-Microsoft-Oracle-SAP-Intel-Novell-SCO-Sybase-Cheyenne solutions. (We just couldn't fit all those logos on them.)

COMPAQ

Has It Changed Your Life Yet?



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PC Magazine Editors' Choice

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Introducing the HP JetDirect EX Plus3 print server.

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Your office has all kinds of printers, and all kinds of printer configurations, all of which can change daily. And it's your job to hook them all up to the network. With a limited number of nodes, that can be a big problem.

Fortunately, there's an easy way out – and in. The new HP JetDirect EX Plus3 print server lets you connect up to three printers to the network, using only one LAN connection. Best of all, it works with any parallel printer, and supports virtually every network protocol and NOS out there.

For fast faxed information, call 1-800-964-1066.* You'll discover that for every problem, there's a solution. At least when it comes to network printing.

NOS Compatibility: Novell NetWare; Microsoft® Windows® 95, Windows NT, Windows for Workgroups, LAN Manager; IBM LAN Server; UNIX®: HP-UX, SunOS, Solaris, IBM AIX, SCO UNIX, lpd; Apple Ethertalk **Management Support:** HP JetAdmin print management software enables consistent installation and management of any HP JetDirect connected printer on the network; supports SNMP-based network management software

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- Three high-performance IEEE 1284 ports
- 3-year return to HP warranty
- HP JetDirect EX and EX Plus3 print servers support all parallel printers
- HP JetDirect cards support HP printers with I/O slots

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